

# Chemical Age

THE WORLD'S NEWSPAPER OF THE CHEMICAL INDUSTRY

**TODAY**



## MR. THERM'S LIBRARY LIST

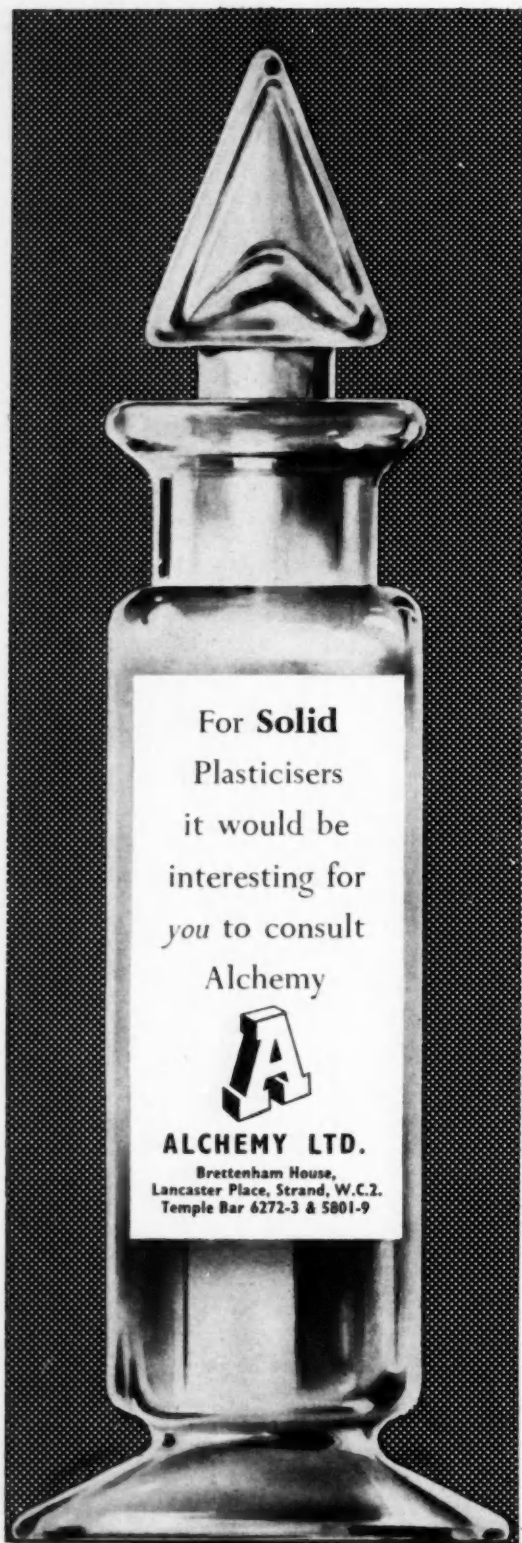
- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_
- 6 \_\_\_\_\_

## **TOMORROW**

Today's Gas Industry research - for example, on high intensity combustion systems - ensures that tomorrow's demand for gas as the most suitable fuel for many processes in the chemical industry will be even greater.

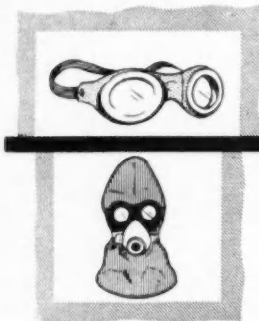
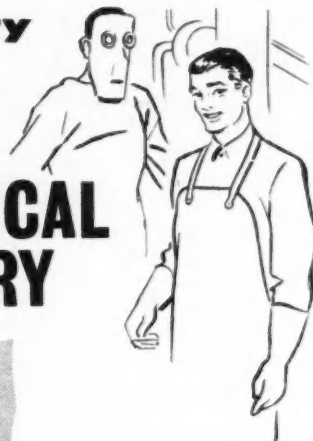
**AND TODAY** every industry and 12 million homes use GAS.





For every  
worker  
in the

# CHEMICAL INDUSTRY



Complete suits in P.V.C. rubberised fabric and asbestos. Gloves in latex rubber, P.V.C., leather and other materials. In fact, a complete range of protective clothing for every worker in the Chemical industry.

**WALLACH**  **BROS. LTD.**  
*For over 70 Years* *Specialists in Industrial Safety*

49, TABERNACLE STREET, LONDON. E.C.2  
Tel. CLErkenwell 1448-9. Grams Hammerman Ave., London

PLEASE WRITE FOR  
**FREE**  
CATALOGUE

# BULK LIQUIDS

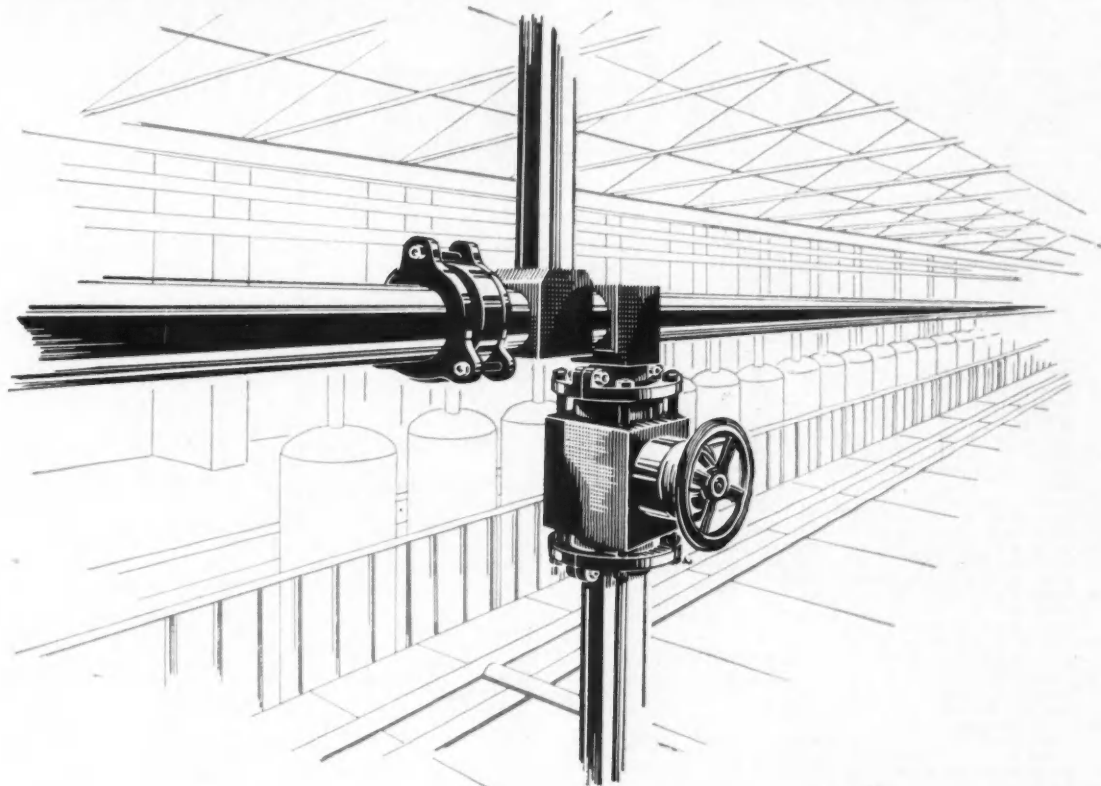


ACIDS CHEMICALS  
ALKALIS SOLVENTS  
CAUSTICS EMULSIONS  
PETROLEUM PRODUCTS

**MONKTON MOTORS LTD**  
WALLINGFORD ROAD,  
UXBRIDGE, MIDD. 5574/5

Continental Enquiries Welcomed

# LET 'KARBATE' IMPERVIOUS GRAPHITE TRADE MARK GLOBE VALVES AND PIPEWORK...



*... carry your corrosive liquids*

'Karbate' Globe Valves and Pipework are giving outstanding service in many installations handling corrosive chemicals and other fluids. It is its great resistance to corrosion, immunity to severe thermal shock, and the property of non-contamination of fluids which makes 'Karbate' so suitable for this type of work. The valves are designed to give close control of flow and their sturdy, compact construction and excellence in design ensures long life and trouble-free operation. 'Karbate' Globe Valves have been in continuous service for many years without any appreciable spindle thread, seat or disc wear.

For full details on how you can benefit by using 'Karbate' Globe Valves and Pipework, contact British Acheson Electrodes Ltd., Wincobank, Sheffield. Telephone No. Rotherham 4836

## KARBATE

TRADE MARK

### IMPERVIOUS GRAPHITE

*The term 'Karbate' is a registered trade mark.*

# INDEX TO ADVERTISERS

The first figures refer to advertisements in Chemical Age Directory & Who's Who, the second to the current issue

Page		Page		Page		Page		Page	
160	A.P.V. Co. Ltd., The	—	Buss Ltd.	—	Enamelled Metal Products Corporation	—		—	
154	Acalor (1948) Ltd.	—	88 Butterfield, W. P., Ltd.	—	(1933) Ltd.	—		—	
83	Accrington Brick & Tile Co. Ltd., The	—	Butterworths Scientific Publications	—	Engelhard Industries Ltd. (Hanovia	—		—	
—	African Pyrethrum Technical Information	—	126 Calder Vale Glassworks Ltd.	—	Lamps Division)	—		—	
—	Centre Ltd.	—	Callow Rock Lime Co. Ltd., The	—	111 Engelhard Industries Ltd. (Baker	—		—	
117	Air Trainers Link Ltd.	—	Cambridge University Press	—	Platinum Division)	—		—	
131	Albany Engineering Co. Ltd., The	—	Cannon (CP) Ltd.	—	English Glass Co. Ltd., The	—		—	
—	Alchemy Ltd.	Cover ii	Carbon Dioxide Co., The	—	G/Card Erinoid Ltd.	—		—	
86	Alginate Industries Ltd.	—	Carlless, Capel, & Leonard Ltd.	—	Evans, Joseph, & Sons (Wolverhampton)	—		—	
100	Allen, Edgar, & Co. Ltd.	—	Catteraon-Smith, R. M., Ltd.	—	Ltd.	—		—	
118	Allen, Frederick (Poplar) Ltd.	—	210 Causeway Reinforcement Ltd.	—	Evered & Co. Ltd.	—		—	
—	Alto Instruments (Gt. Britain) Ltd.	—	Chapman & Hall Ltd.	—	Evershed & Vignoles Ltd.	—		—	
—	Alumina Co. Ltd., The	—	Chemical Age Enquiries	321 & 322	Extrudex Ltd.	—		—	
102	Anglo-Dal Ltd.	—	178 Chemical Construction (G.B.) Ltd.	296	90 Farnell Carbons Ltd.	—		—	
—	Anthony, Mark, & Sons Ltd.	—	Chemical & Insulating Co. Ltd., The	293	Fawcett, Preston & Co. Ltd.	—		—	
166	Armour Hess Chemicals Ltd.	285	106 Chemical Workers' Union	—	124 Feltham, Walter H., & Son Ltd.	—		—	
G/Card	Ashmore, Benson, Pease & Co. Ltd.	—	Chemicals & Feeds Ltd.	—	Ferraris, Fred. Ltd. (Clerkenwell)	—		—	
—	Ashworth, Arthur, Ltd.	—	Chemidus Plastics Ltd.	—	138 Ferris, J. & E., Ltd.	—		—	
—	Associated Electrical Industries Ltd.	—	Chemitrade Ltd.	—	Fibrolene	—		—	
—	Motor & Control Division	292	Christy & Norris Ltd.	—	130 Film Cooling Towers (1925) Ltd.	—		—	
—	Associated Electrical Industries Ltd.	—	Ciba (A.R.L.) Ltd.	—	Fisher Governor Ltd.	—		—	
—	Turbine-Generator Division	Cover iv	110 Ciba Clayton Ltd.	—	Foamite Ltd.	—		—	
103	Associated Lead Mfrs. Ltd.	—	Ciech Ltd.	—	Ford, T. B., Ltd.	—		—	
169	Automotive Products Ltd.	—	City Engineering Co. (Boreham Wood) Ltd.	—	Foster Instrument Co. Ltd.	—		—	
—	Avo Ltd.	—	Clark Ltd.	—	93 Foxboro-Yoxall Ltd.	—		—	
—	B.S.A. Tools Ltd.	—	Classified Advertisements	319 & 320	Foyle, W. & G., Ltd.	—		—	320
—	Baird & Tatlock Ltd.	—	95 Clayton, Son & Co. Ltd.	—	Freeman Taylor Machines Ltd.	—		—	
143	Baker Perkins Ltd.	—	142 Clydesdale Chemical Co. Ltd., The	—	198 Fullers Earth Union Ltd., The	—		—	
—	Baldwin Instrument Co.	—	Cochran & Co. (Annan) Ltd.	—	Gallenkamp, A., & Co. Ltd.	—		—	
159	Balfour, Henry, & Co. Ltd.	—	Cohen, George, Sons & Co. Ltd.	—	Gas Council, The	Front cover		—	
120	Balfour Group of Companies, The	—	121 Cole, R. H., & Co. Ltd.	—	General Electric Co. Ltd.	—		—	
—	Barclay Kellett & Co. Ltd.	—	90 Collins Improved Firebars Ltd.	—	134 Glebe Hines Ltd.	—		—	
—	Bellingham & Stanley Ltd.	—	Colt Ventilation Ltd.	—	218 Goodyear Pumps Ltd.	—		—	
—	Bennett, H. G., & Co. (Gloves) Ltd.	—	Colvin-Smith Ltd.	—	Gowlands Ltd.	—		—	
87	Bennett, Sons & Shears Ltd.	—	133 Comet Pump & Eng. Co. Ltd., The	—	107 Grainer Mfg. Co. Ltd.	—		—	
G/Card	Berk, F. W., & Co. Ltd.	—	Consolidated Zinc Corporation Ltd.	313	109 Grazebrook, M. & W., Ltd.	—		—	
104	Bivac Air Company Ltd.	—	Constable & Co.	—	122 Greeff, R. W., & Co. Ltd.	—		—	
132	Black, B., & Son Ltd.	—	Constructors, John Brown, Ltd.	—	Grindley & Co. Ltd.	—		—	
2	Blackman, Keith, Ltd.	—	Contoura Photocopying Ltd.	—	Grubb Parsons, Sir Howard, & Co. Ltd.	—		—	
—	Blaw, Knox, Chemical Engineering Co	—	Controlled Convection Drying Co.	—	138 Haller & Phillips Ltd.	—		—	
197	Blundell & Crompton Ltd.	—	Cooke, Troughton & Simms Ltd.	—	124 Harris (Lostock Gralam) Ltd.	—		—	
—	Bobby, William, & Co. Ltd.	311	Crofts (Engineers) Ltd.	—	Hartley Electromotives Ltd.	—		—	
—	Borax & Chemicals Ltd.	—	Cromil & Piercy Ltd.	—	Hathernware Ltd.	—		—	
84	Borax Consolidated Ltd.	—	Crosfield, Joseph, & Sons Ltd.	—	Haworth, F. (A.R.C.), Ltd.	—		—	
—	Borer Engineering Co. Ltd.	—	99 Cruickshank, R., Ltd.	—	Hearson, Charles & Co. Ltd.	—		—	
4	Boulton, William, Ltd.	—	214 Curran, Edward, Engineering Ltd.	—	144 Heathway Machinery Co. Ltd.	—		—	
97	Bourne Chemical Industries Ltd.	—	171 Cynamid of Great Britain Ltd.	—	Helmets Ltd.	—		—	
—	Bowmans Chemicals Ltd.	—	88 Cyclops Engineering Co. Ltd., The	—	Herbert, Alfred, Ltd.	—		—	
119 & 147	Braby, Frederick, & Co. Ltd.	—	Cygnat Joinery Ltd.	—	High Pressure Components Ltd.	—		—	
86	Bristol Piping Co. Ltd., The	—	Daglish, John, & Sons Ltd.	—	Hilger & Watts Ltd.	—		—	
—	British Acheson Electrodes Ltd.	283	150 Danks of Netherthorn Ltd.	—	183 Holland, B. A., Eng. Co. Ltd., The	—		—	
—	British Carbo Norit Union Ltd.	—	149 Davey & Moore Ltd.	—	Hopkin & Williams Ltd.	—		—	
—	British Ceca Co. Ltd., The	317	173 Davey, Paxman & Co. Ltd.	—	Humphreys & Glasgow Ltd.	—		—	
—	British Celanese Ltd.	289	Dawson, McDonald & Dawson Ltd.	—	6 Huntingdon, Herbelein & Co. Ltd.	—		—	
—	British Drug Houses Ltd., The	—	Degenhardt & Co. Ltd.	—	I.C.I. Billingham Division	—		—	
—	British Dyewood Co. Ltd., The	—	94 Derby Luminescents Ltd.	—	I.C.I. Catalysts	—		—	
—	British Ermeto Corporation Ltd.	—	Distillers Co. Ltd., The	—	I.C.I. Ltd. Heavy Organic Chemicals	—		—	
Spine	British Geon Ltd.	—	175 Distillers Co. Ltd., The (Chemical Div.)	—	I.C.I. Metals Titanium D.	—		—	
—	British Industrial Solvents	—	Distillers Co. Ltd., The (Engineering Div.)	—	I.C.I. Plastics—Darvic	—		—	
220	British LaBour Pump Co. Ltd.	—	163 Dorr-Oliver Co. Ltd.	—	I.C.I. Plastics—Fluon	—		—	
—	British Lead Mills Ltd.	—	139 Doulton Industrial Porcelains Ltd.	—	I.C.I. Ltd. (Plastics Division), Corvic	—		—	
Spine	British Resin Products Ltd.	—	Dowling Lime & Stone Co. Ltd., The	—	I.C.I. (Fluorube) Ltd.	—		—	
152	British Rototherm Co. Ltd., The	—	136 Dring & Fage Ltd.	—	Industrial Descaling Tools Ltd.	—		—	
89	British Steam Specialties Ltd., The	—	183 Drummond Patents Ltd.	—	Industrial Tapes Ltd.	—		—	
134	British Tar Products Ltd.	—	151 Dupree Swift & Co. Ltd.	—	Infra Red Development Co. Ltd., The	—		—	
—	British Thomson-Houston Co. Ltd., The	—	96 E.C.D. Ltd.	—	International Combustion Group	—		—	
231	British Titan Products Co. Ltd.	—	Electric Resistance Furnace Co.	—	127 International Furnace Equipment Co Ltd.,	—		—	
267	Broadbent, Thomas, & Sons Ltd.	—	Electro-Chemical Engineering Co. Ltd.	—	The	—		—	
137	Brotherhood, Peter, Ltd.	—	Electronic Switchgear (London) Ltd.	—	Interscience Publishers Ltd.	—		—	
—	Brough, E. A., & Co. Ltd.	—	Electrothermal Engineering Ltd.	—	Isopad Ltd.	—		—	
101	Bryan Donkin Co. Ltd., The	—	Elga Products Ltd.	—	102 Jackson, J. G., & Crockett Ltd.	—		—	
—	Burndept Ltd.	—	Elliott, H. J., Ltd.	—	Jacobson Van Den Berg & Co. (U.K.) Ltd.	—		—	
132	Burnett & Rolfe Ltd.	—	158 Elmatic	—	(continued on page 286)	—		—	
162	Bush, W. J., & Co. Ltd.	—							

## FILTER CRUCIBLES of Porous Porcelain

Made by

The **WORCESTER**  
**ROYAL PORCELAIN CO.**  
LIMITED

Supplied by all recognised Laboratory Furnishers.

retain the finest precipitates and filter rapidly. They are not affected by acids, remain constant in weight within very fine limits and can be heated to high temperatures.



# NEW!

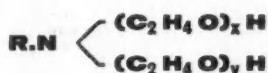
## ETHOMEENS

— now added to the British production range of  
Armour Chemicals, which already includes Armeens, Armacs, Duomeens,  
Arquads and other cationic and amphoteric chemicals.

The first of the new series available is:—

## ETHOMEEN C/25

Structural formula:



where R denotes the coco fatty acid radical and  $x+y=15$ .

Average Molecular weight: **875**

Appearance at 25°C: **Dark liquid**

Specific Gravity at 25°C/25°C: **1.042**

Solubility: **In all proportions with water, benzol,  
acetone and isopropanol at 25°C.**

Partially soluble in carbon tetrachloride and other solvents.

Chemically the Ethomeens are tertiary amines and form  
quaternary and other salts. Because the hydrophilic moiety of  
Ethomeen C/25 consists of 15 ethylene oxide molecules, it  
behaves like a nonionic compound. Ask for Bulletin L-25, which  
describes this Ethomeen and reveals some of its applications.



**ARMOUR HESS**  
**CHEMICALS LIMITED**



# INDEX TO ADVERTISERS

The first figures refer to advertisements in Chemical Age Directory & Who's Who, the second to the current issue

Page		Page		Page		Page		Page	
125	Jenkins, Robert, & Co. Ltd.	---	82	National Industrial Fuel Efficiency Service	293	Shipping Studies Ltd.	---	---	---
---	Jenkinson, W. G., Ltd.	---	115	Neckar Water Softener Co. Ltd.	290	Short & Mason Ltd.	---	---	---
3	Jobling, James A., & Co. Ltd.	---	---	Negretti & Zambra Ltd.	---	91	Siebe, Gorman & Co. Ltd.	---	---
---	Johnson, Matthey, & Co. Ltd.	---	---	New Metals & Chemicals Ltd.	---	---	Siemens Edison Swan Ltd.	---	---
98	Johnsons of Hendon Ltd.	---	---	Newnes, George, Ltd.	---	---	Sifam Electrical Instrument Co. Ltd.	---	---
---	Jones & Stevens Ltd.	288	---	Nicolson, W. B. (Scientific Instruments) Ltd.	---	---	Simon, Richard, & Sons Ltd.	---	---
108	K.D.G. Instruments Ltd.	---	---	Nitrate Corporation of Chile Ltd.	---	---	Sipon Products Ltd.	---	---
148	K.W. Chemicals Ltd.	288	---	Nordac Ltd.	---	128	Southern Instruments Analytical Dept.	---	---
---	Kaylene (Chemicals) Ltd.	---	146	Odoni, Alfred A., & Co. Ltd.	---	128	Spencer Chapman & Messel Ltd.	---	---
---	Kellie, Robert, & Sons Ltd.	---	---	G/Card Oil & Colour Chemist' Association	---	---	Stabilag Co. Ltd., The	---	---
---	Kellogg International Corporation	---	---	Operation Britain	---	266	Stanton Instruments Ltd.	---	---
110	Kernick & Son Ltd.	---	136	Optical-Mechanical (Instruments) Ltd.	---	---	Stationery Office, Her Majesty's	---	---
265	Kestner Evaporator & Engineering Co. Ltd.	295	---	Orr Products Ltd.	---	92	Staveley Iron & Chemical Co. Ltd.	---	---
---	Kestner Evaporator & Engineering Co. Ltd. (Keebush)	---	---	Palfrey, William, Ltd.	---	---	Steel, J. M., & Co. Ltd.	---	---
---	Kestner (Industrial Safety) Ltd.	---	---	Pascall Engineering Co. Ltd., The	---	---	Steel & Cowlishaw Ltd.	---	---
130	Kier, J. L., & Co. Ltd.	---	8	Paterson Engineering Co. Ltd., The	---	---	Stockdale Engineering Co. Ltd.	---	---
---	King, G. W., Ltd.	---	161	Peabody Ltd.	---	---	Stonehouse Paper & Bag Mills.	---	---
208	Kingsley & Keith Ltd.	---	---	Penrhyn Quarries Ltd.	286	---	Streamline Filters Ltd.	---	---
184	Kleen-e-zz Brush Co. Ltd., The	---	---	Perkin & Elmer Sales Ltd.	---	---	Sturge, John & E. Ltd.	---	---
---	---	---	---	Permal Ltd.	---	156	Sutcliffe Speakman & Co. Ltd.	---	---
122	Laboratory Apparatus & Glass Blowing Co.	---	194 & 232	Permutit Co. Ltd., The	---	---	Synthite Ltd.	---	---
224	Lambeth & Co. (Liverpool) Ltd.	---	---	G/Card Petrocarbon Developments Ltd., The	---	149	"T.P." Chemical Engineering Co. Ltd.	---	---
---	Langley Alloys Ltd.	---	---	Petrochemicals Ltd.	---	155	Taylor Rustless Fittings Co. Ltd., The	---	---
112	Lankro Chemicals Ltd.	---	150	Plastic Filters Ltd.	---	142	Taylor Stainless Metals Ltd.	---	---
205	Laporte Chemicals Ltd.	---	---	Platon, G. A., Ltd.	---	152	Thermal Syndicate Ltd., The	---	---
114	Lavino (London) Ltd.	---	154	Podmores (Engineers) Ltd.	---	---	Thermo Plastics Ltd.	---	---
173	Leda Chemicals Ltd.	---	206	Polyenco Ltd.	---	---	Thompson, John (Dudley) Ltd.	---	---
96	Leek Chemicals Ltd.	---	223	Pool, J. & F., Ltd.	---	120	Titanium Metal & Alloys Ltd.	---	---
---	Lees, Henry, & Co. Ltd.	---	---	Pott, Cassels & Williamson Ltd.	288	---	Todd Bros. (St. Helens & Widnes) Ltd.	---	---
112	Leigh & Sons Metal Works Ltd.	---	---	Potter, F. W., & Soar Ltd.	---	144	Towers, J. W., & Co. Ltd.	---	---
---	Lennig, Charles & Co. (Great Britain) Ltd.	---	180	Powell Duffryn Corbon Products Ltd.	---	---	Townson & Mercer Ltd.	---	---
---	Lennox Foundry Co. Ltd.	---	---	G/Card Power-Gas Corporation Ltd., The	---	---	Turners Asbestos Cement Co. Ltd.	---	---
129	Light, L., & Co. Ltd.	---	---	Preston, J., Ltd.	---	---	Triangle Valve Co. Ltd.	---	---
135	Lind, Peter, & Co. Ltd.	---	197	Prat-Daniel (Stammore) Ltd.	---	210 & 224	Tylers of London Ltd.	---	---
118	Liquid Solid Separations Ltd.	---	128	Price Stutfield & Co. Ltd.	---	---	Unicone Co. Ltd., The	---	---
---	Lloyd & Ross Ltd.	---	---	Price's (Bromborough) Ltd.	317	---	Unifloc Ltd.	294	---
B/cover	London Aluminium Co. Ltd., The	---	---	Prodorite Ltd.	---	---	Unilever Ltd.	315	---
142	London Sand Blast Decorative Glass Works Ltd., The	---	---	Purkis, Williams Ltd.	---	---	Union Carbide Ltd.	---	---
---	---	---	190	Pye, W. G., & Co. Ltd.	---	104	United Coke & Chemicals Co. Ltd.	---	---
---	Longman Green & Co. Ltd.	---	---	Pyrene Co. Ltd.	---	---	United Filters & Engineering Ltd.	---	---
92	Lord, John L., & Son	Cover iv	---	Pyrene-Panorama Ltd.	---	---	G/Card Universal-Matthey Products Ltd.	---	---
---	Loughborough Glass Co. Ltd.	---	162	Pyrometric Equipment Co. Ltd., The	---	---	Vacu-Blast Ltd.	---	---
---	---	---	---	Q.V.F. Ltd.	---	---	Van Nostrand Co. Ltd.	---	---
---	McCarthy, T. W., & Sons Ltd.	320	---	Quickfit & Quartz Ltd.	---	---	Vaughan Crane Co. Ltd.	---	---
---	MacLellan, George, & Co. Ltd.	---	---	Radiation Shieldings	---	183	Voss Instruments Ltd.	---	---
---	Maine, B. Newton Ltd.	---	186	Reads Ltd.	---	---	W.E.X. Traders Ltd.	---	---
126	Manesty Machines Ltd.	---	---	Rediwell Ltd.	---	---	Walker, James, & Co. Ltd.	---	---
177	Marchon Products Ltd.	---	140	Research Utilities Ltd.	---	---	Walker, P. M.	---	---
---	Marson, W. E., & Co.	---	---	Reynolds & Branson Ltd.	---	---	Wallach Bros. Ltd.	Cover	---
---	Marston Excelsior Ltd.	---	---	Rheem Lysaght Ltd.	---	105	Waller, George, & Son Ltd.	---	---
108	Matthews & Yates Ltd.	---	---	Richmond Welding Co. Ltd.	---	98	Wallis, Charles & Sons (Sacks) Ltd.	---	---
---	May & Baker Ltd.	---	---	Robinson, F., & Co. Ltd.	---	123	Ward, Thos. W., Ltd.	---	---
---	Measuring & Scientific Equipment Ltd.	---	---	G/Card Rose, Downs & Thompson Ltd.	---	---	Warren-Morrison Ltd.	---	---
---	Medway Paper Sacks Ltd.	---	---	153 & 188	Dr. Rosin Industrial Research Co. Ltd.	152	Watson, Laidlow, & Co. Ltd.	---	---
---	Mervyn Instruments & Co. Ltd.	290	---	---	---	---	Weil, J., & Son	---	---
---	Front cover Metal Containers Ltd.	---	124	Rotometer Manufacturing Co. Ltd.	---	---	Wellington Tube Works Ltd.	---	---
---	Metafiltration Co. Ltd.	---	---	Royal Netherlands Industries Fair.	---	116	Wells, A. C., & Co. Ltd.	---	---
---	G/Card Metalock (Britain) Ltd.	---	---	S.I.C. Plastics Ltd.	---	220	Wengers Ltd.	---	---
126	Metcalf & Co.	---	118	S.P.E. Company Ltd.	---	---	Whessoe Ltd.	---	---
---	Metropolitan-Vickers Electrical Co. Ltd.	---	---	Saint-Gobain	Cover iii	---	Whiffen & Sons Ltd.	---	---
148	Middleton & Co. Ltd.	---	113	Sandiacre Screw Co. Ltd., The	---	184	Whitaker, B., & Sons Ltd.	---	---
---	Mills Packard Construction Co. Ltd.	---	---	Saunders Valve Co. Ltd.	---	---	White, Child & Beney Ltd.	---	---
---	Mine Safety Appliances Co. Ltd.	---	---	Scientific Design Co. Inc.	---	123	Widnes Foundry & Engineering Co. Ltd.	---	---
---	Mirreles Watson Co. Ltd., The	---	---	Scientific Glass-Blowing Co. Ltd.	---	202	Wilcox, W. H., & Co. Ltd.	---	---
140	Mirvale Chemical Co. Ltd., The	---	---	Scientific Instrument Manufacturers' Association of Great Britain Ltd.	---	136	Wilkinson, James, & Son Ltd.	95	---
---	Mitchell, L. A., Ltd.	---	---	Scott, Ernest & Co. Ltd.	---	94	Williams & James (Engineers) Ltd.	---	---
141	Mitchell Cotts Co. Ltd.	287	---	Scott, George & Son (London) Ltd.	---	122	Wilson, Edward, & Son Ltd.	---	---
---	Mond Nickel Co. Ltd., The	---	---	Sharples Process Engineers Ltd.	---	114	Wood, Harold & Sons Ltd.	286	---
120	Monkton Motors Ltd.	Cover ii	---	Shaw Petrie Ltd.	---	156	Worcester Royal Porcelain Co. Ltd., The	284	---
---	Monsanto Chemicals Ltd.	---	193	Shell Chemical Co. Ltd.	291	---	Worthington-Simpson Ltd.	---	---
---	Morgan Refractories Ltd.	---	---	Shell-Mex & B.P. Ltd.	---	---	Wynn (Valves) Ltd.	---	---
---	Moritz Chemical Engineering Co. Ltd.	---	---	---	---	116	Yorkshire Tar Distillers Ltd.	---	---
---	Mulberry Co., The	---	---	---	---	106	Zeal, G. H., Ltd.	---	---

## "Fullersite"

SLATE FILLER

WHEREVER AN INERT FILLER  
IS REQUIRED FULLERSITE  
IS THE IDEAL MATERIAL

**PENRHYN QUARRIES LTD.**

PORT PENRHYN, BANGOR, NORTH WALES

CARRIERS OF

## LIQUIDS IN BULK

ACIDS · OILS · SPIRITS  
AND GENERAL CHEMICALS

**HAROLD WOOD & SONS LTD.**

Wormald St. · Heckmondwike

Tel.: Heckmondwike 1011/5

Branch Office: Cranes Close, Nevendon Industrial Estate, Basildon, Essex.  
Telephone: Basildon 20511-2.

# MOND NICKEL PRODUCE HIGH QUALITY CHEMICALS

**Nickel** Oxides · Sulphate · Ammonium  
Sulphate · Nitrate · Acetate · Chloride · Formate  
Carbonate · Hydrate

**Cobalt** Oxides · Sulphate · Nitrate · Acetate  
Chloride · Formate · Oxalate · Phosphate  
Carbonate · Hydrate

**Selenium** Metallic powder · Dioxide  
Ferro-Selenium · Selenites of Sodium · Barium  
and Zinc

**Tellurium** Metallic Powder

For further information  
please write to:



**THE MOND NICKEL COMPANY  
LIMITED**

THAMES HOUSE MILLBANK LONDON SW1

SOLIDS-LIQUIDS-GASES-SOLIDS-LIQUIDS-GASES-SOLIDS  
**DRIERITE**  
 SOLIDS-LIQUIDS-GASES-SOLIDS-LIQUIDS-GASES-SOLIDS

THE VERSATILE DESICCANT  
**UNIQUE CHARACTERISTICS**

Dries all organic liquids  
**CONSTANT** efficiency up  
 to 95% exhaustion

**KW**  
**CHEMICALS LTD**  
**KW**

55/57  
 HIGH HOLBORN  
 LONDON W.C.1  
 T.A. CHLORATE  
 T.N. CHANCERY  
 7981/5

## The *New* type **RZR** **LABORATORY** **STIRRER**

Designed especially for scientific and laboratory use the RZR incorporates an infinitely variable drive giving FULL motor output over the entire speed range.

Six speeds range are available. A totally enclosed and powerful induction motor completely eliminates sparking and the danger of explosion.

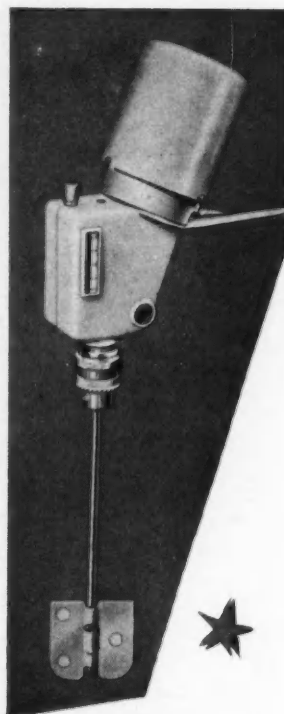
*...technically  
 perfect!*

Write now for illustrated folder and full information.

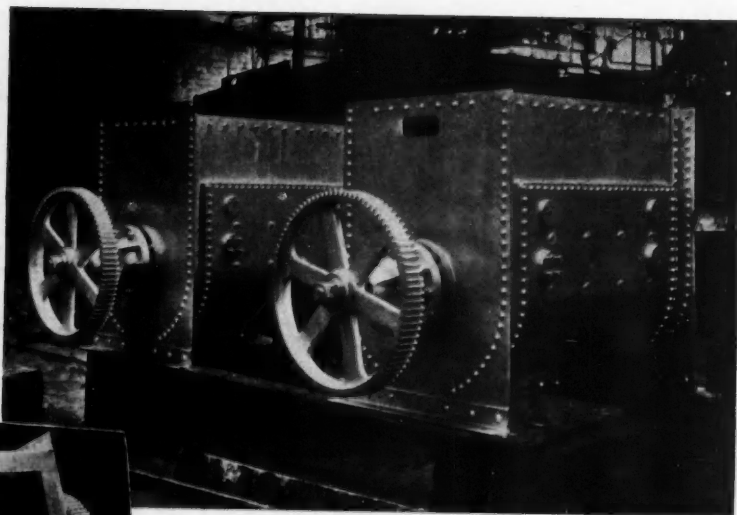
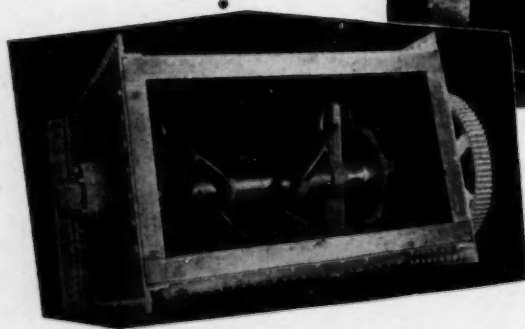
**Jones & Stevens Ltd.,**  
 Long Lane, Littlemore, Oxford

Telephone: OXFord 78232/3 (2 lines)

Cables: Instruments, Oxford



## MIXING VESSELS



These hot water jacketed Mixing Vessels (capacity 1/2 Ton each) are for use in chocolate manufacture. The lower photograph shows the stirring gear. We manufacture Mixers, Blenders and Process Vessels for a wide range of Industries and applications.

**POTT, CASSELS & WILLIAMSON LTD • MOTHERWELL • SCOTLAND**



# British Celanese

Limited

**expanding in chemicals**

welcome enquiries for new products,  
particularly in the petrochemical and  
cellulose derivative fields

**the many**

**'Celanese' chemicals**

**and allied products**

**Include**

**orders large or small**

Celanese resources are geared to  
bulk shipments, but small orders  
receive equally prompt and  
careful attention

**Acetamide (Technical)**

**Acetyl acetone**

**Cellulose acetate flake**

**Diethyl sulphate**

**Diketene**

**Methyl acetamide**

**N-Methyl cellulose ('Celacol')**

**Trichlorethyl phosphate  
(T.C.E.P.)**

**Sodium carboxymethyl  
cellulose ('Courlose')**

**Vinyl acetate monomer**

*Write for information and samples to:—*

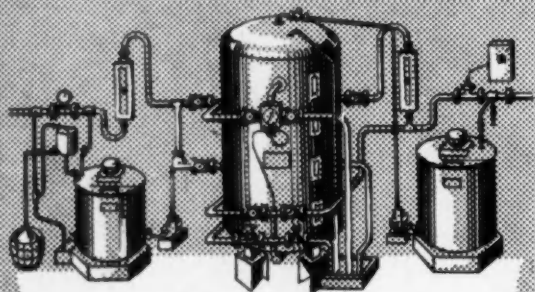
Chemical Sales Department  
**BRITISH CELANESE LIMITED**  
Foleshill Road, Coventry  
Telephone: 88771



*'Celanese' chemicals*

# PURE WATER

for Industrial  
purposes



## ION EXCHANGE

is the most up-to-date  
method of producing pure water  
for all requirements, and it  
does this at a fraction  
of the cost of distillation.

*Literature, describing  
the full range of Ion Exchange  
processes and plants,  
available on application.*

# NECKAR

NECKAR WATER SOFTENER CO. LTD.  
Artillery House · Artillery Row · London, S.W.1.



*Looking for traces?*



THE  
**MERVYN-HARWELL**  
**SQUARE WAVE POLAROGRAPH**  
Mk. III

is a fundamental Scientific advance in the  
field of Analysis, Testing and Quality  
control.

Whether you are "Looking for Traces" in processing  
Metals or Foodstuffs, carrying out research on  
Gas or Petroleum, or linking quality testing with  
production processes, you should have the  
**MERVYN-HARWELL SQUARE WAVE  
POLAROGRAPH Mk. III.**

- Analyses minute quantities.
- Extremely sensitive.
- Exceptionally selective.
- Completely self-contained.
- Versatile, Adaptable.
- Operators need not be specialists.
- Strikingly convenient, mobile.
- Resolves 20 m.v.
- Built-in cell, thermostat.
- Deoxygenated supply & recorder.
- Reversible & irreversible reactions.
- Controls located and ganged for rapid, accurate operation.

*Please send for further information, mentioning  
"Chemistry & Industry" to:-*

••••• **MERVYN INSTRUMENTS** •••••

COPSE ROAD · ST. JOHN'S  
WOKING · SURREY  
Telephone Woking 5290



Who are you supposed to be?

*A Shell Chemical's chemist.*

What are you making?

*S.B.A. . . secondary butyl alcohol.*

Do Shell make secondary-what-you-said?

*I'll say they do—and they have  
a super delivery service.*



# **SHELL CHEMICAL COMPANY LIMITED**

*In association with Petrochemicals Limited and Styrene Products Limited*

**Regional Offices:** LONDON  
MANCHESTER  
BIRMINGHAM  
GLASGOW  
BELFAST  
DUBLIN

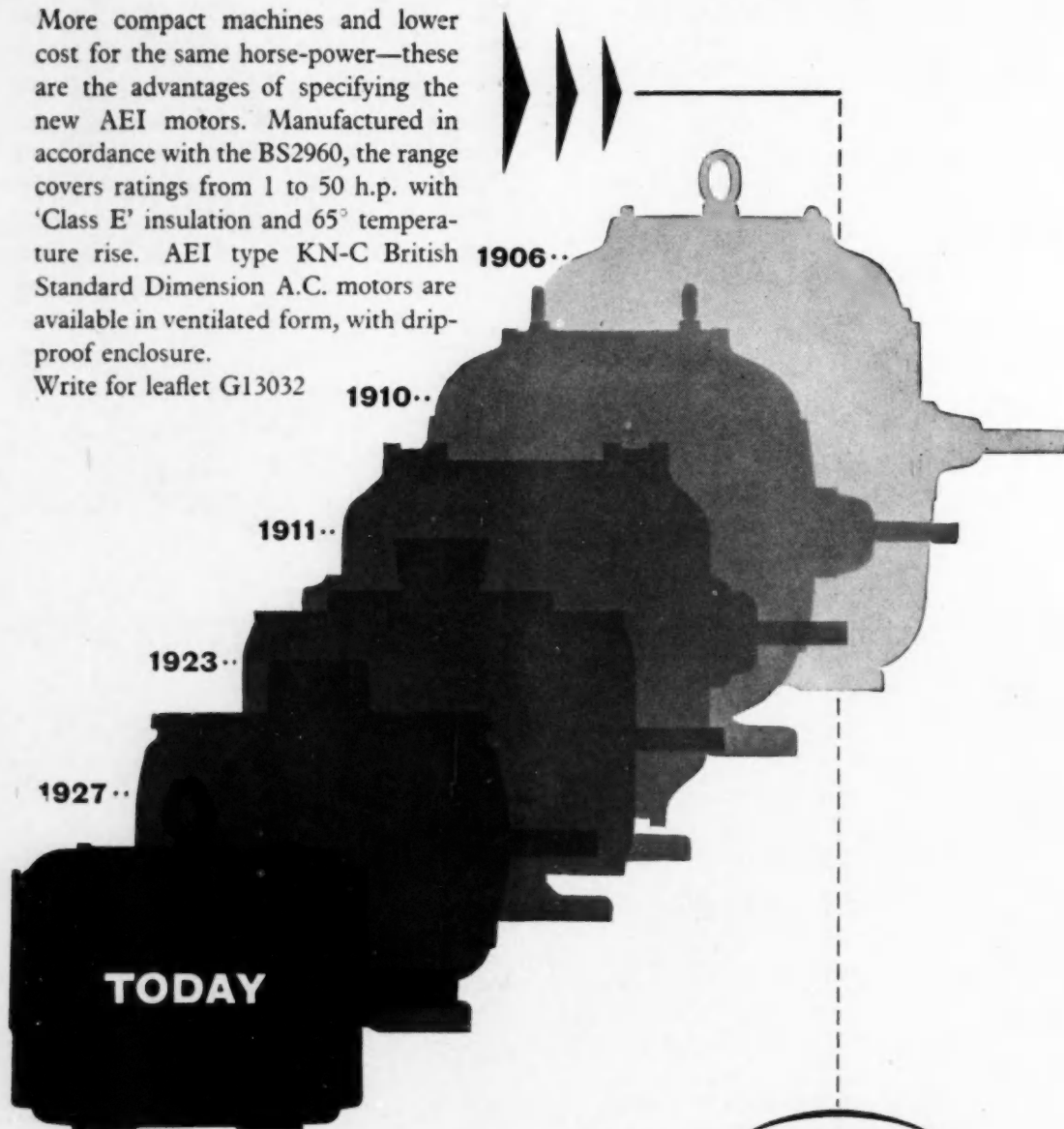
Norman House, 105-9, Strand, W.C.2. Tel: Temple Bar 4455.  
144-6, Deansgate, 3. Tel: Deansgate 2411.  
14-20, Corporation Street, 2. Tel: Midlands 6954.  
48-54, West Nile Street, C.I. Tel: City 3391.  
16-20, Rosemary Street. Tel: Belfast 26094.  
33-34, Westmoreland Street. Tel: Dublin 72114.

# COMPACT HORSEPOWER with the new

## AEI British Standard Dimension Motors

More compact machines and lower cost for the same horse-power—these are the advantages of specifying the new AEI motors. Manufactured in accordance with the BS2960, the range covers ratings from 1 to 50 h.p. with 'Class E' insulation and 65° temperature rise. AEI type KN-C British Standard Dimension A.C. motors are available in ventilated form, with drip-proof enclosure.

Write for leaflet G13032



**AEI**

**ASSOCIATED ELECTRICAL INDUSTRIES LIMITED**  
MOTOR & CONTROL GEAR DIVISION

RUGBY & MANCHESTER, ENGLAND



INCORPORATING THE MOTOR & CONTROL GEAR INTERESTS OF BTH & M-V







**SIR MILES THOMAS—Chairman of  
MONSANTO CHEMICALS LTD. writes:—**

*"Experience of the assistance N.I.F.E.S can give has satisfied me that there must be very few firms which could not benefit from its services. As Chairman of the British Productivity Council I recommend those who have not yet done so to get in touch with N.I.F.E.S since it is in the field of productivity that its achievements are most striking."*

*Miles Thomas.*

**CALL IN N.I.F.E.S—INDUSTRY'S OWN NON-PROFIT-MAKING SERVICE FOR  
ADVICE ON THE EFFICIENT USE OF ALL FUELS, HEAT AND POWER.**

*For address of nearest Area Engineer write to:—*

**N.I.F.E.S**

*National Industrial Fuel Efficiency Service*

**Head Office: 71 GROSVENOR STREET LONDON W1 • Telephone: Hyde Park 9706**

DARLINGTON

**magnesia**

**FOR ALL INDUSTRIAL  
AND PHARMACEUTICAL  
PURPOSES . . . . .**

*Sole selling agents in Great Britain*

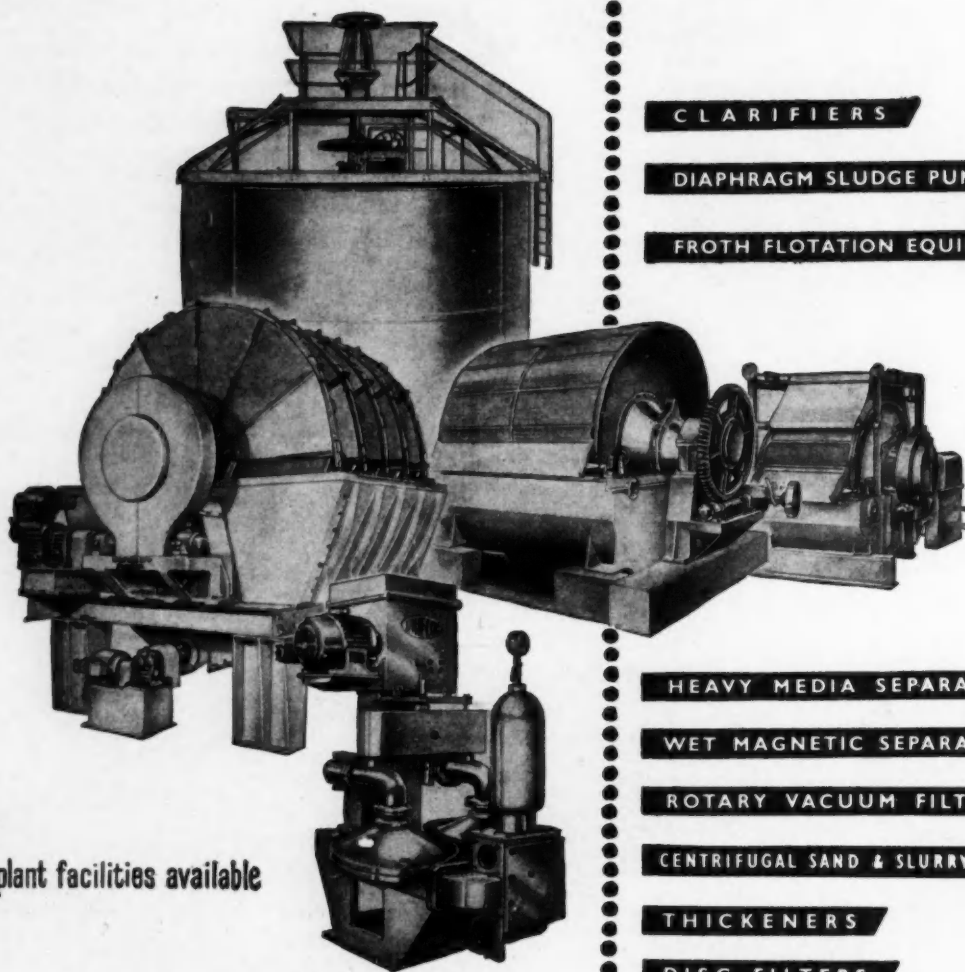
**CLIFFORD  
CHRISTOPHERSON  
& CO LTD**

**TELEPHONE: KENSINGTON 3422  
TELEGRAMS: CHRISTOPHERSON,  
WESPHONE, LONDON**

**1 KNIGHTSBRIDGE GREEN,  
LONDON, S.W.1**



# *Plant* for wet material handling



CLARIFIERS

DIAPHRAGM SLUDGE PUMPS

FROTH FLOTATION EQUIPMENT

HEAVY MEDIA SEPARATORS

WET MAGNETIC SEPARATORS

ROTARY VACUUM FILTERS

CENTRIFUGAL SAND & SLURRY PUMPS

THICKENERS

DISC FILTERS



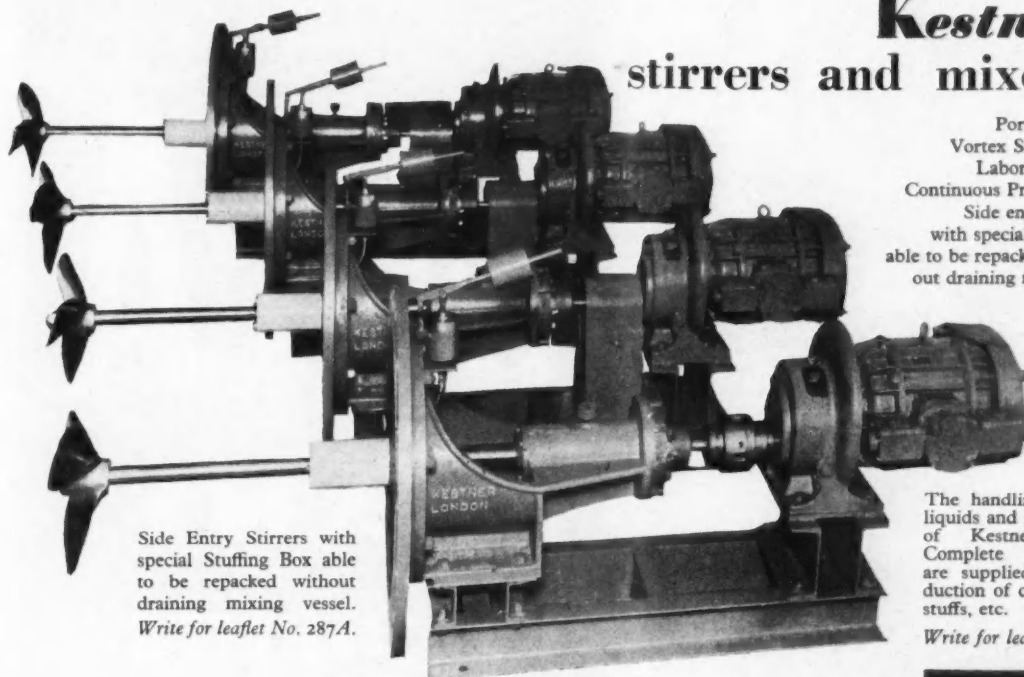
Test plant facilities available

## *unifloc plant*

UNIFLOC LIMITED, 2-3, ST. MARY STREET, SWANSEA · TELEPHONE 55164

## **Kestner** stirrers and mixers

Portable Stirrers  
Vortex Stirrers  
Laboratory Mixers  
Continuous Process Mixers  
Side entry stirrers  
with special stuffing box  
able to be repacked with-  
out draining mixing vessel



Side Entry Stirrers with  
special Stuffing Box able  
to be repacked without  
draining mixing vessel.  
Write for leaflet No. 287A.

The handling of corrosive  
liquids and gases is but one  
of Kestner's activities.  
Complete process plants  
are supplied for the pro-  
duction of chemicals, food-  
stuffs, etc.

Write for leaflet No. 282/A.



KESTNER EVAPORATOR & ENGINEERING CO. LTD. 5 GROSVENOR GARDENS, LONDON, S.W.1

## **INDUSTRIAL WILKINSON CHEMICALS**

*Specialists in the Production of*

- FLUORINE COMPOUNDS
- HYDROFLUORIC ACIDS
- ANALYTICAL REAGENT ACIDS

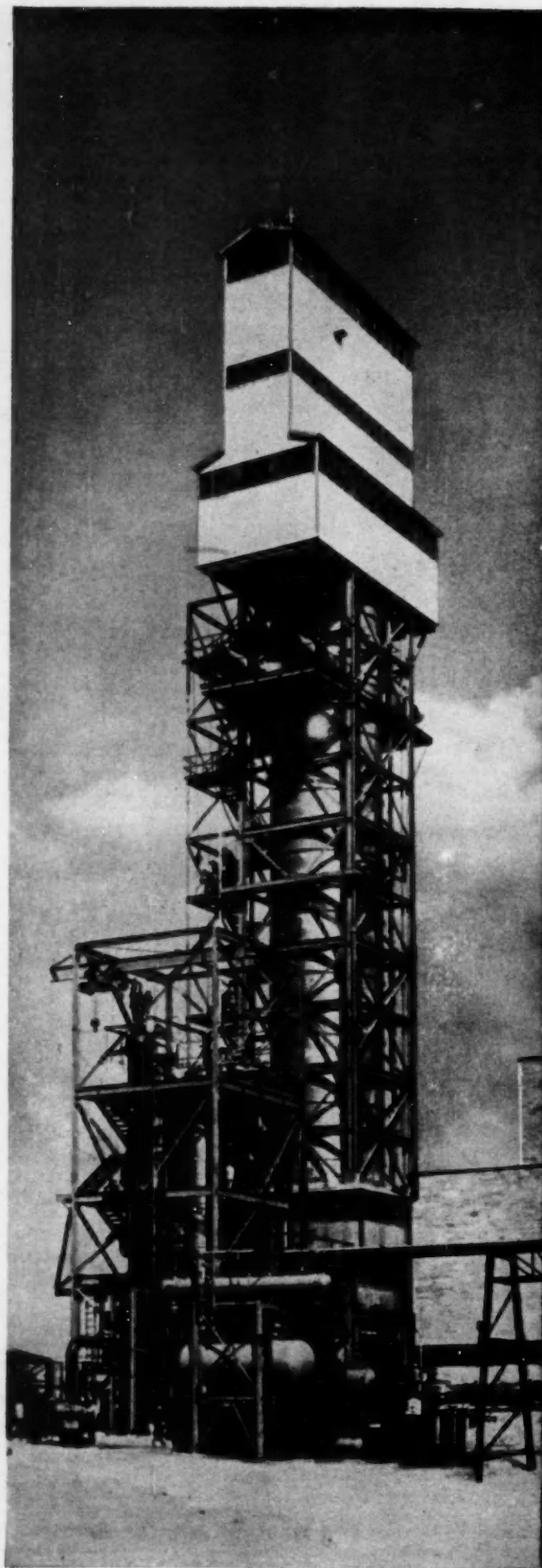
A MEMBER OF THE LAPORTE GROUP OF COMPANIES

**James Wilkinson & Son Ltd**

TINSLEY PARK ROAD • SHEFFIELD 9  
TELEPHONE 41208 (3 LINES) 'GRAMS: CHEMICALS, SHEFFIELD 9

LONDON AGENTS & DISTRIBUTORS

**JOSEPH WEIL & SON LTD., FRIARS HOUSE,**  
39-41 NEW BROAD STREET LONDON, E.C.2.



# UREA

## PLANTS

by **CHEMICO**  
are profitable  
investments

The success of the CHEMICO synthetic urea process is now acclaimed throughout the world. The process has been commercially proven wherever CHEMICO urea plants have been installed. CHEMICO urea plants in production or under construction have a total capacity of nearly 350,000 tons of urea per year. On completion of all new projects, the CHEMICO process will account for a larger proportion of the world's urea output than any other commercial process.

 **CHEMICO**

CHEMICAL CONSTRUCTION (S.B.) LTD.  
2 Henrietta Place, London, W.1. LANCING 6871



VOL. 82 No. 2096  
 SEPTEMBER 12 1959

Telephone: FLEet Street 3212 (26 lines)  
 Telegrams: Allangas - Fleet - London

Editor Manager  
 M. C. HYDE R. C. BENNETT  
 Director N. B. LIVINGSTONE WALLACE

Midland Office  
 Daimler House, Paradise Street,  
 Birmingham. [Midland 0784-5]

Leeds Office  
 Permanent House, The Headrow,  
 Leeds 1. [Leeds 22601]

Scottish Office  
 116 Hope Street, Glasgow C2.  
 [Central 3954-5]

## IN THIS ISSUE

New Chlorine Recovery Process	298
British Association Annual Meeting	299
W. C. Holmes and Claus Kilns	301
Distillates	302
Chemicals at Scottish Exhibition	303
U.K. Tour to New York Exposition	304
Equipment Review	305
New Extruded Chlorinated Polyether	307
Polarography Congress at Cambridge	308
Overseas News	309
Spevack's Process for D <sub>2</sub> O	312
Better Natural Rubber Techniques	312
People in the News	314
Obituary	314
Commercial News	316
Market Reports	316
Trade Notes	316
New Patents	318
Diary Dates	318

Annual subscription is: home, 52s 6d,  
 overseas, 60s, single copies 1s 6d (by  
 post 1s 9d)

# CHEMICAL AGE

BOUVERIE HOUSE • 154 FLEET STREET • LONDON • EC4

## SCIENCE AND MAN

PRESIDENTIAL addresses of the British Association for the Advancement of Science have of latter years come to be much more than the usual address at the opening of a conference. They can justly be considered as an authoritative statement by an eminent scientist. Last year, Sir Alexander Fleck, as president, chose to speak on science and business. The previous year Professor P. M. S. Blackett called for the science and technologies of the better developed countries to assist the underdeveloped ones, while a year earlier Sir Edward Appleton had stressed the need for scientists to reach the layman.

This year's president, Sir James Gray, who has specialised in biology, chose to call on men of science to see that social life depends as much on moral principles as on scientific knowledge. It is impossible, he says, to be a scientist without being a human being.

Scientists, Sir James knows, find it more and more difficult to keep abreast of all the main lines of development within their own subject and almost impossible to know what is happening in other fields. One of the most important social aspects of science these days is its repercussions on international relationships. Unfortunately as Sir James points out, it is not possible to make much of an impression on public opinion while men's minds are "biased by fear and suspicion." The "discoveries of physics have frightened mankind," so that a great many intelligent people are looking askance at science. Hence it is suggested that in trying to link the sciences to humanities the primary objective should be to depict man's position in the world of Nature as a source, not of fear or doubt, but of courage and inspiration. A second main objective should be "to demonstrate the place of science in the general philosophy of life." The gap between a scientific and a humanitarian outlook cannot be bridged, he feels, by the statistical laws of physics and chemistry. The challenge is therefore to the biological sciences and the answers to the behaviour of organisms and their relationship to environment may well decide how far science can claim to be of direct cultural significance.

It is easy, says Sir James, to say that science should be welded to humanities, but less easy to suggest how this should be done. To try to meet the need, he pleads for a wider outlook in the teaching of science. Our national economy depends on our ability to make and exploit new scientific discoveries; and to maintain or extend our standards, more professional scientists and highly trained technicians are required. Highly trained specialists form only a very small proportion of the population and Sir James suggests "we may be paying for them in very hard currency if we have to deny to a very much larger fraction of the community a reasonable chance of seeing life steadily and as a whole." Thus if a widespread interest in science is desired, the seeds must be sown in the schools and in organised centres of adult population.

Is there really an unmet need for scientists in Great Britain? Sir James suggests there is. Economist, Professor John Jewkes, presenting his presidential paper to the BA's economics section on "How much science?" says that it seems fairly certain that in the three years 1956-59 scientists were

being produced by the universities at a rate commensurate with the increase in demand. The need now is for a continuing search for better criteria for determining how much the community should devote to science and technology.

The 'unmet need' which is frequently suggested, Professor Jewkes says, implies that those who exercise the demand for scientists are not sufficiently conscious of their value to the community. Unmet need is an elusive concept, but four reasons given for believing it exists are noted by the professor. First, that Britain is lagging behind the U.S., and the U.S. behind the U.S.S.R. "These international comparisons, when they include the U.S.S.R. are for the most part hazardous statistical exercises with non-comparable material."

The second reason, based on the efforts made to establish correlations between the rate of change of industrial output and the number of scientists and technologists in industry is unsatisfactory, Professor Jewkes intimates, because of the statistical material employed and hence the deductions based on it. A third reason given is that since some industries spend on research and development relatively more than others, this proves that the second group is lagging. Lastly, attempts have been made to measure the net gains arising out of expenditure on research and development.

Similarly, Jewkes considers that if Government departments and businesses really consider themselves short of scientists they should be prepared to narrow the margin between scientists' salaries and the higher salaries usually given to administrators (often scientists turned administrators); conversely, if they deemed it wise not to narrow this margin, they should accept the logic that it was administrators who were in short supply and not scientists. In other words, the question posed is whether or not our judgment is being distorted by the tendency to exaggerate the part that science has played in raising living standards; by overstressing the potential material benefits of the more recent spectacular scientific discoveries; and by belittling the contribution made to economic expansion by skills and capacities non-scientific in character. This is indeed food for thought.

## NEW FLUORINATING AGENT

**COMPOUND** with unusual fluorinating properties is sulphur tetrafluoride, now available in development quantities from E.I. Du Pont de Nemours Inc. (dyes and chemicals division) Wilmington, Delaware, U.S. This fluoride is stated to simplify the preparation of existing fluorides and to react with a variety of carboxylic acids and carbonyl compounds, including aldehydes, ketones, and quinones to give new fluorine-containing compounds.

Sulphur tetrafluoride is prepared by reacting sulphur dichloride with sodium fluoride suspended in acrylonitrile at 70° to 80°C. One distillation gives over 90% pure sulphur tetrafluoride, the main impurity being thionyl fluoride.

At room temperature, sulphur tetrafluoride is a gas and has an inhalation toxicity similar to phosgene. Hydrogen fluoride is released on contact with moisture.

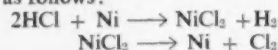
Using the new agent, a new class of compounds—organo-imino sulphur difluorides have been produced (by reacting the fluorinating agent with compounds containing carbon-nitrogen multiple bonds. Used in fluorination of aldehydes and ketones good yields of difluorinated derivatives are obtained, Du Pont state. Some quinones react with SF<sub>4</sub> like ketones while others react to give fluorination and aromatization of the ring. Reacted with carboxylic acids, trifluorinated compounds are produced. Fluorination is found to be selective (unsaturated acids give corresponding trifluoromethyl derivatives e.g. acrylic acid gives trifluoropropene).

The fluorinating ability of sulphur tetrafluoride could find wide use in adding fluorine to steroids, tranquillisers and

other drugs. It would lead, it is suggested to new and improved insecticides and herbicides, and in the plastics and elastomers field to produce high thermal stability, and resistance to oxidation.

## CHLORINE RECOVERY

**A**NOTHER chlorine recovery process is reported, this time from Seattle University, U.S. Inventor of the process is Professor David W. Schroeder, who electrolyses by-product HCl as follows:



A commercial chlorine recovery unit as visualised by Schroeder would have two cells (or sets of cells). One cell produces chlorine and the other, which needs no electricity, hydrogen. After a period (possibly about 48 hours) the first cell has a heavy deposit of nickel while the second is depleted in nickel. The roles of the cells are then reversed. For the process feed, HCl gas is absorbed in depleted nickel chloride solution, or if the HCl is aqueous, it is mixed with previously concentrated NiCl<sub>2</sub> solution.

This process has been investigated in the laboratory, but Schroeder suggests that estimated costs based on his work would compare favourably with those estimated by Monsanto Chemical for the De Nora process of direct HCl electrolysis (CHEMICAL AGE, 20 June, p. 1028). Investment for both processes is put at \$20,000/daily per ton. Power consumption claimed by Schroeder is only 1,300 kWh. per ton compared with De Nora's 1,750 kWh. He also reports that no diaphragm is required for his process since only one gaseous product, hydrogen, is yielded in the electrolysis. De Nora's process uses a membrane of polyvinyl chloride.

## CONCENTRATING DILUTE HCl

**PROCESS** technique is the theme of the congress to be held by the East German Chemical Society at Weimar from 17 to 19 September. Most of the delegates and speakers will be from Hungary, Czechoslovakia and other Eastern European States. It is apparent from a perusal of the papers to be given that there is considerable interest in processing dilute hydrochloric acid gas containing water vapour so that concentrated acid and pure hydrogen chloride gas can be obtained. The reason for this interest is the growing demand in Eastern Europe for chlorine.

From the Leipzig-based chemical construction and engineering office, VEB Konstruktions- und Ingenieurbüro Chemie, Dr. R. Vieweg reports that he has been investigating an adiabatic absorption process to concentrate dilute hydrogen chloride gas containing water vapour. Concentration of the gas produced is limited by the water content of the raw gas, but a process based on disproportionate distillation has been found to give concentrated acid, even when there is a very unfavourable gas composition.

Production of pure HCl gas is possible, says Vieweg by salting-out the acid with concentrated salt solutions, but is costly and uneconomic. Isolation of the acid from new gas can be carried out, however, using adiabatic absorption and disproportionate distillation, but only up to a certain water-vapour content of the new gas. In less favourable conditions dehydration of the gas by concentrated salt solutions followed by absorption and disproportionate distillation is indicated.

Recovery of hydrogen chloride from waste hydrochloric acid has also been under investigation at VEB Elektrochemisches Kombinat at Bitterfeld, East Germany. Dr. H. Sobel, from this company reports that from waste hydrochloric acid formed in chlorination and hydrochlorination processes, hydrogen chloride of almost 100% purity may be obtained by distillation. The azeotropic mixture of 20% hydrochloric acid employed for absorption can be used again.

# CONTROVERSY AT B.A. ANNUAL MEETING



At the reception for the Chemistry Section dinner: l. to r.: left, W. E. Abbott (Trent River Board, Nottingham), Mrs. Abbott and H. Ward, consultant, Wimbledon. Right: Lord Mayor of York, Lady Albermarle, president of Section X, Dr. I. J. Faulkner (I.C.I., Billingham Division), hon. recorder of Chemistry Section, and Prof. J. Timmermans (Prof. of Chemistry, Brussels University)

## Prof. Stacey's Chemistry Address Criticised by 'The Times'

**P**RESIDENT'S address to the Chemistry Section of the British Association for the Advancement of Science during the annual meeting at York last week was criticised the following morning by the science correspondent of *The Times* as being "little more than a catalogue of names".

Professor M. Stacey, F.R.S., Mason Professor of Chemistry at Birmingham University and section president, whose address was on medical applications of complex carbohydrates, made a spirited reply at the Chemistry Section annual dinner on 4 September. He said he would like to give *The Times* reporter a lesson in carbohydrate chemistry.

*The Times* had stated on 4 September: "For the wider audience for whom British Association meetings are largely intended there must have been a lack of balance in today's proceedings. Two important sections—physics and chemistry—had presidential addresses on subjects too specialised to suit the occasion, although the speaker was in each case a world authority and provided a review well suited to others working in similar fields."

"Professor L. F. Bates, F.R.S., of Nottingham University, speaking on the visualisation of magnetic processes, was helped out by a collection of attractive pictures. Professor M. Stacey, F.R.S., of Birmingham University, put so much material into his address that for any but a specialist, it became little more than a catalogue of different names with indications that many were important or might become so. That is not what a British Association meeting is for."

Responding to the toast of the Chemistry Section, proposed at the dinner by Professor N. B. Chapman, G. F. Grant Professor of Chemistry, Hull University, Professor Stacey was in jocular mood. He declared: "Today I am attacked by *The Times* viciously. They said the stuff I gave yesterday is not the stuff that the British Association wants. The British Association does not exist to get science over to the lay

public, but to the educated lay public. It is absolutely impossible in one lecture to tell anyone what the structure of glucose is, let alone D-glucosamine".

*The Times* reporter might have had a fit if he had tried to do that. Professor Stacey added amid laughter that he would like to give him a lesson in carbohydrate chemistry.

The annual meeting of the British Association, the sixth to be held in York since the inaugural meeting was staged there in 1831, attracted some 3,000 members. For the Chemistry Section meetings there were about 450 members.

Chemistry Section papers were presented as follows: 'The carbohydrate components of nucleic acids', by Prof. S. Laland; 'The bacterial cell wall', by Prof. J. Baddiley; 'Proteins', by Dr. G. T. Young and Prof. H. D. Springall; 'Chemistry and Clothing', by

W. H. Rees, Prof. C. S. Whewell, A. B. Thompson and Dr. H. A. Thomas; 'Rocket propulsion', by Dr. W. B. Littler, G. K. Adams, J. E. P. Dunning, Dr. G. H. S. Young, and Dr. L. R. Shepherd; 'Chemistry in the preservation of antiquities' (with Section H) by Dr. A. E. A. Werner and R. M. Organ.

An open forum at Queen Anne Grammar School, York, on 3 September attracted a large audience of young



Prof. E. G. Cox, Prof. of Inorganic and Structural Chemistry, Leeds University

people. The panel included Dr. I. J. Faulkner (I.C.I. Billingham Division) and Dame Kathleen Lonsdale (Professor of Chemistry, University College, London).

Proposing the toast of 'The Chemistry Section' at the annual dinner, Professor N. B. Chapman, Hull University, said that in no other branch was it so important that the public and members of other branches of science should



L. to r., at the reception, Mrs. Stacey, Prof. M. Stacey, Chemistry Section president, E. A. Cook (university liaison officer, I.C.I., Northwich) and Mrs. Cook





Left: l. to r., Mrs. Thomson, A. F. Thomson (Rowntree and Co. Ltd.), local hon. secretary for the Chemistry Section, and Dr. I. J. Faulkner (I.C.I., Billingham Division), hon. recorder, Chemistry Section. Right: Mrs. K. Short, sister of Sir Lindor Brown, Mrs. J. D. Wardlaw, widow of the late Prof. W. Wardlaw, and Mrs. Overend, wife of Prof. W. G. Overend (Prof. of Chemistry, Birkbeck College, London)

understand what their work was about. It was, he declared, the business of the British Association to spread knowledge of science; a valuable aspect of that was in explaining to the lay public what scientists were about. In addition, the B.A. had taken on the important task of



J. N. Gammon, patent agent, Distillers Co. Ltd., Epsom, with J. H. Davies, left, and J. E. Whitley, right, research graduates in radiochemistry at Durham University

interesting the young in science and scientific discoveries.

In his presidential address, Professor Stacey had shown how chemistry was providing a driving force for improvements and developments in all aspects of medicine.

Responding to the toast, Professor Stacey said he was most impressed by the number of young people present. It was a healthy sign that so many young people had been attracted to the Chemistry Section meetings. The British Association gave them the chance of

keeping up to date.

In the past three years he had attended meetings in the U.S.S.R., America and Canada, and he was "intimidated by the massive efforts which the Russians and the Americans are putting into science and the tremendous importance they lay on meetings such as those of the B.A."

Some 9,000 chemists had attended the half-yearly meeting at Boston, while there had been 10,000 at a Moscow meeting. But, he added, the Russians did not take their meetings quite so seriously as the Americans; their conferences were more akin to the British. They were, however, highly specialised. So far as chemistry was concerned they were concentrating on polymers and plastics and they would make a mark on world markets in due course.

The British would have to train more people, and if their universities were too big then they would have to build more universities. There were 26,000 students at Ohio State University—that was far too big a student population. The figure at Birmingham was 5,000.

Mr. W. J. V. Ward, chairman of I.C.I. Billingham Division, proposed the toast of 'Our Guests', to which the Lord Mayor of York replied. He hoped that before his term of office ended next May York's application for a university would be granted.

#### Butadiene by Sea

I.C.I.'s Heavy Organic Chemicals Division is now delivering butadiene by sea. Recently the Danish tanker, *Inger Tholstrup*, left Teesport with 90 tons of liquid butadiene in her pressurised tank. The vessel is the first of two similar tankers being used to carry butadiene to major customers both in the U.K. and abroad.



L. to r., Mrs. Ham, Dr. A. J. Ham (Shell Research Station, Chester), Dr. N. S. Capper (Her Majesty's Inspectorate)

### Three New Silicone Rubber Stocks and Price Cuts by Midsil

THREE new general-purpose silastomer rubber stocks with improved processing characteristics have been developed at the laboratories of Midland Silicones Ltd. at Barry, South Wales. These development products, 2452, 2453, 2454, are particularly suitable for extruded insulation for cable covering.

Apart from their use for extrusion, these new rubbers have excellent moulding and calendaring properties.

Further information can be obtained from the head sales office at 68 Knightsbridge, London S.W.1, or from area offices.

Midland Silicones also announce a further reduction in the price of Silastic LS-53, a fluorinated silicone rubber which is serviceable from  $-60^{\circ}\text{C}$  to over  $+200^{\circ}\text{C}$ . This new price cut of 10% is in addition to other price reductions which have taken place since October 1958, making a total reduction of a third since then. As from 9 September the price of Silastic LS-53 will be 1 to 9 lb. lots 185s/lb. (previously 205s/lb.) and 10 to 99 lb. lots 180s/lb. (previously 200s/lb.).

### Q and Q Glassware to be Distributed in Canada

INCREASED dollar earnings should follow the signing of an agreement between Quickfit and Quartz Ltd., manufacturers of interchangeable laboratory glassware, Stone, Staffs, and Corning Glassworks of Canada Ltd., for the distribution of Q and Q laboratory glassware throughout Canada. Corning will sell these products through established laboratory-apparatus supply houses already distributing the Corning range of Pyrex laboratory glassware.

Quickfit and Quartz have already doubled sales of laboratory apparatus to Canada in the past 12 months, and Mr. E. L. Harrison, sales director, hopes that under the new arrangement they will be doubled again. Corning have already placed an order worth about \$50,000.

### I.C.I. Alkali Division's New H.Q.

I.C.I. Alkali Division's new headquarters at Northwich will be officially opened by Sir Alexander Fleck on 15 January, 1960. Departments will begin to move from the existing divisional offices into the new building towards the end of this year.

### Semtex Acid-Resistant Lining for Monsanto Ruabon Plant

Acid-resistant lining for a 250,000-gallon holding tank is to be installed by Semtex Ltd. at the Ruabon (Denbighshire) works of Monsanto Chemicals Ltd. The order, valued at £6,400, is one of the largest of its type placed with Semtex, and follows the installation of similar linings at the same factory about five years ago.



## Technicon Instruments Co. Ltd. to Manufacture in U.K.

TECHNICON Instruments Co. Ltd., 26 Warwick Road, London S.W.5, have speeded up the manufacturing programme in the U.K. of their Auto-Analyser.

The Technicon AutoAnalyser is a system for continuous automatic chemical analysis which can detect trace materials down to parts per billion with an accuracy of 1%. By automating each step of a chemical analysis now performed manually, that is, measuring, mixing, purifying, processing, comparing and recording, and integrating them into a continuous flow system, the Auto-Analyser provides dependable analysis with exact reproducibility.

In the plant, the AutoAnalyser can be hooked up to the process or waste stream liquid or gas. The concentration level of any material or number of materials can be continuously monitored and permanently recorded.

## Judgement in Pyrethrum Sampling Test Case

JUDGEMENT for the Pyrethrum Board of Kenya was given in the Supreme Court of Nairobi on 28 August in a test case which was brought against the Board by East African Extract Corporation Ltd. Mr. Justice Miles awarded costs to the Pyrethrum Board.

The case was heard in June. East African Extract Corporation were claiming damages in a dispute as to the correct method of sampling pyrethrum flowers delivered by the Pyrethrum Board to the Corporation.

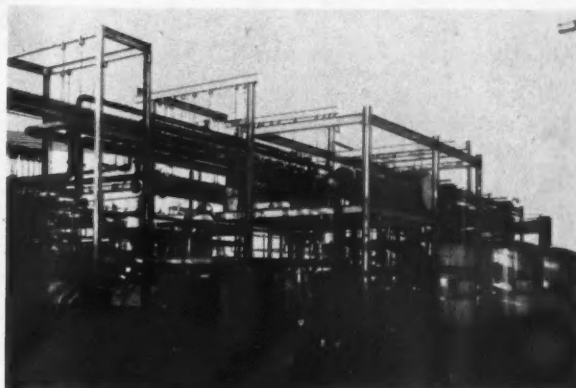
The Corporation had alleged that £25,675 had been overpaid on the first 500 tons of pyrethrum supplied by the Board against a contract which calls for the delivery of about 5,800 tons of pyrethrum between 1 January, 1958 and 30 June, 1961.

In his 34-page judgement, Mr. Justice Miles said that the kernel of the case was the implied term in the contract that the method of sampling should be accurate. He said the evidence pointed to the overwhelming probability that the Board's hand sampling method was accurate and that the Corporation's sampling machine, which showed a variation over the material period of some 14%, must be inaccurate.

## I.C.I.'s Beryllium Plant Dispute Ended

Beryllium production at Imperial Chemical Industries' new Birmingham plant has been threatened by a dispute. Some of the 45 men engaged on installation work refused to enter certain parts of the plant where they have to wear special clothing, unless they were paid an extra 1s. an hour. The ban, which has been in force for three weeks, was lifted on Thursday last week, to enable union-management talks to be held.

## W. C. Holmes Acquire Rights for Claus Kilns from Courtaulds



Claus kilns constructed by Courtaulds

THE Chemical Engineering Division of W. C. Holmes and Co. Ltd., Turnbridge, Huddersfield, which has built a number of Claus kilns based on the older processes, has now taken up the manufacturing rights to build modern kilns based on plant developed by Courtaulds Ltd., and constructed at their Trafford Park Works. These are of the latest design incorporating full heat recovery. The efficiency of conversion is 90/95% and the tail gases discharged to atmosphere fully satisfy the requirements of the Alkali Inspector. The Trafford Park plant comprises two kilns, each having a capacity of 30 tons of pure sulphur per day.

The hydrogen sulphide, mixed with one-third of the air burned in a complete combustion, is burned in a combustion chamber and then passed to a waste heat boiler where high pressure steam is generated. Some sulphur is produced during combustion and cooling and is separated before the gases pass to two catalytic vessels where the reaction is completed. Sulphur is separated after each catalytic stage and the temperature is adjusted to that required for the next stage. A final combustion and absorption stage completes

the process. The sulphur is recovered in liquid form and can be pumped to another process or cast into blocks of convenient form. The solid sulphur can be ground to flowers of sulphur of high quality.

Licences have also been acquired from the Gas Council for the use of their processes covered by patent Nos. 769,995 and 769,996 which enable Claus kilns to operate at higher conversion efficiency by the recycling of gases round the catalyst and to produce better effluent gases by catalytic combustion of the final traces of hydrogen sulphide.

The Claus kiln can be applied to the conversion to sulphur of hydrogen sulphide recovered from fuel gases such as coal gas and natural gas or to waste gases from sulphate of ammonia plant.

The Chemical Engineering Division of W. C. Holmes and Co. can also supply plant for the recovery of the hydrogen sulphide from the initial gases including processes involving washing with ammonia, ethanalamine or soda/potash solutions and are, therefore, fully equipped to engineer, build and commission complete installations for gas purification with pure sulphur as the end product.

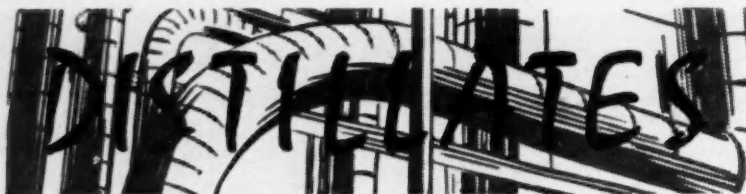
## Experiments with Silicones as Stone Preservers and Waterproofers

EXPERIMENTS carried out by the Building Research Station on the value of silicone preparations on the one hand as preservatives for stonework and on the other as waterproofing agents for brickwork have revealed no evidence that encourages the belief that silicones will be more effective than any other stone preserving agent. This is stated in the annual report of the Building Research Station, Garston, 'Building Research 1958,' published by D.S.I.R. by H.M.S.O., price 5s 6d (U.S.A., 99 cents) and by post 6s.

According to the report on silicones, in some cases application of silicones has hastened rather than delayed

deterioration. Caution is therefore urged in their use and it is suggested that small areas of stonework should be tried experimentally before large-scale application is made.

It is reported that silicones have been found useful for rainproofing brickwork, and a useful effect has been observed up to five years after the application of the solution. At the same time it is emphasised that use of waterproofing solutions is almost always a palliative and that nothing can replace correct initial design and use of the right materials. Also covered in the report are bricks, pile foundations, etc.



★ **ALTHOUGH** I have often commented on secrecy in the chemical industry I have never found a modern parallel to a story told by Sir Alexander Fleck when he opened the Cleveland Technical College at Redcar, Yorks.

Around 1600 when alum manufacture in Italy was a monopoly of the Pope, a young Englishman, Sir Thomas Chaloner, succeeded in gaining entry to the works at Puteoli and had a good look round. He noticed that the surrounding vegetation was very like that of some parts of his North Riding estate and concluded, rightly, that there would be alum there. He smuggled a number of key workers home to England in big casks and started the first chemical industry in an area that has become famous as the home of Imperial Chemical Industries. For this he was excommunicated by the Pope.

The alum works flourished, especially after James I prohibited the import of alum from the Pope's mines, but their prosperity was too great a temptation for Charles I, who 'nationalised' them. Under Cromwell they were denationalised, but the damage was done and the industry never recovered.

★ **ONE** of the most interesting sessions of the British Association annual meeting in York last week was a special youth forum at which a distinguished panel of experts grappled with some rather fundamental questions. The panel, which included Dame Kathleen Lonsdale, Professor of Chemistry at University College, and Dr. I. J. Faulkner, I.C.I.'s ammonia works manager at Billingham, was, for instance, asked: "Is there a limit to the storage capacity of the brain?"

Another was whether scientists should be responsible for the application of their discoveries. Perhaps the most interesting was "What scientific invention or discovery in post-war years promises to be of greater social benefit to mankind?" In their replies the panel mentioned a number of basically pre-war discoveries, such as antibiotics, blood plasma, etc. Dr. Faulkner, however, suggested that vapour-phase chromatography would prove to be of great universal benefit.

★ **FROM** an open forum at which controversy is expected to another British Association event at which it is not—the Chemistry Section presidential address. Given by Professor M. Stacey, it drew from *The Times* science correspondent the scathing comment that it

was not suitable for a B.A. meeting (see p. 299).

Although I did not hear the talk, a copy of the paper shows that Professor Stacey simplified much of the subject, making it interesting to chemists in other fields. Chemistry Section members I talked to at York—and they included industrial executives, research graduates and lecturers—found it a stimulating address.

It is difficult to see how a paper that appeals to chemists with different interests can also be made intelligible to readers of *The Times* unless they have had a basic training in chemistry.

★ **A NEW** travel idea that is likely to prove popular in the British chemical industry offers a nine-day visit to the U.S. to attend the New York Exposition of Chemical Industries to be held later this year. The price, which includes good central hotel accommodation and return air travel by the Boeing 707 jet, is only £225.

Mr. D. J. Lloyd Davies, a director of the London travel agency that is making the special arrangements, tells me that with the co-operation of the exposition authorities he hopes to include in the tour visits to some U.S. chemical plants.

This exhibition, held every two years, is the major U.S. trade fair of the chemical and chemical plant industries. In the past, the few British chemical industry people who have visited the exposition have been directors and top sales executives. This new economy trip should provide the means of extending U.K. representation to include design and construction engineers, operating and research personnel.

★ **SINCE** 1949, when petrochemicals were first included in a stand of the Distillers Company Ltd., at the Scottish Industries Exhibition, each succeeding exhibition has seen an approximate doubling of the activities at Grangemouth. The plants of British Hydrocarbon Chemicals Ltd. are now nearing the stage at which Grangemouth will be the largest producer of basic petrochemicals outside the U.S.

The new Grangemouth plant to make 'Rigidex polyethylene,' which should have been completed in April 1959, was delayed by a number of circumstances, including unofficial strikes by contractors' employees. It is now being commissioned and when at full capacity will produce 11,000 tons a year. Towards the end of 1959, the new B.H.C. phenol plant will be completed, giving the U.K.

a new source of an important industrial organic chemical. The D.C.L. method which converts cumene to phenol and acetone, has been licensed for use in Belgium, Canada, France, Germany, Italy, Japan and the U.S. It is estimated that by 1960, the method will be used for making at least 150,000 tons a year of the world's phenol.

The new ethylene plant due for completion by 1960 will have an annual capacity of some 70,000 tons a year—the largest producer outside the U.S., doubling the present Grangemouth capacity. Most of the output will supply present and projected ethylene uses at Grangemouth and give a small surplus for future developments.

When all these projects are completed, B.H.C. investments at Grangemouth will total more than £30 million.

★ **DIATOMITE** production in Skye has been temporarily stopped by Scottish Diatomite Ltd., to allow, as stated in *CHEMICAL AGE* last week, p. 270, plant and techniques to be redeveloped. Mining of diatomite, perhaps better known as kieselguhr, is a small post-war industry in Skye. The present plant, I learn, is technically inadequate to meet competition from German suppliers. If it is reopened, the first essential will be a new plant for drying and calcination.

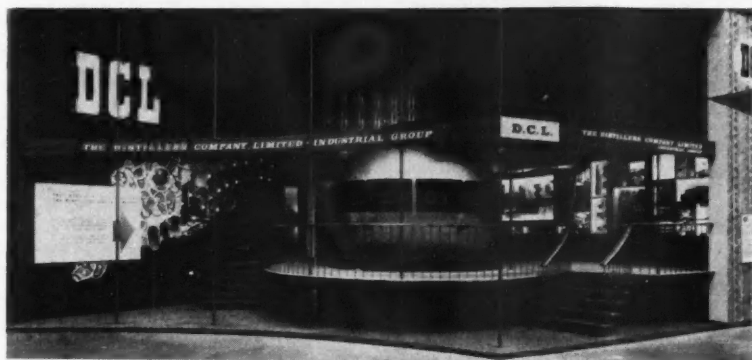
In the meantime, present users who have been obtaining supplies from Skye will probably have their needs met by imports from Denmark and other Continental countries. In any case, it could prove just as quick, if not quicker, to obtain diatomite from sources other than Skye which is not particularly well served from the freight point of view.

★ **THOSE** versatile silicones are in the news again. It seems that a new, unique silicone rubber produced by Dow Corning—U.S. associates of Midland Silicones—holds great promise as a weapon in the scientific fight against crime. Speaking to members of the American Academy of Forensic Sciences, Joseph Nicol, Professor of Criminalistics, Michigan State University, said that this new product can be used to make longer-lasting and more accurate impressions of fingerprints, footprints, tyre and jemmy marks.

The new liquid, an R.C. type of silicone rubber which sets up to form a rubber solid in less than five minutes, flows into hairline cracks and accurately reproduces every mark on any surface to which it is applied. It can be poured at any temperature and greatly eases the taking of foot or tyre prints made in snow, slush or mud. It will also enable detectives to lift finger prints from irregular surfaces, such as gun barrels.

*Alembric*

# Chemical Industry at Scottish Exhibition



General view of the Industrial Group section on the stand of Distillers Co. shows the sphere which houses the model of Grangemouth

## D.C.L. Industrial Group Features Expansion at Grangemouth

ONE of the most spectacular displays at the Scottish Industries Exhibition which opened in Glasgow last week is that of the Distillers Co. Ltd. The D.C.L. stand occupies more than 1,600 sq. ft. and includes two separate display areas telling the stories of the company's whisky and industrial activities.

Central feature of the Industrial Group exhibit is a model of the whole of the Grangemouth site, on a scale of 1:500. Housed in a globe some 10 ft. in diameter, the model is viewed through a series of portholes. The globe is floodlit from below the raised floor of the section. The model is lit from inside the globe alternately by normal and by u.v. lighting, thus showing it under day-time and night-time conditions.

Purpose of the exhibit is to show the British Hydrocarbon Chemicals plants as forming an efficiently laid-out and busy works, typical of the best in modern chemical plant design. Sectional displays deal with the general scheme of chemical processes at Grangemouth; the D.C.L. process for making phenol; production, properties and applications of the 'Rigidex polyethylene', new plant for which is now coming into production at Grangemouth; D.C.L. Plastics Group production of polystyrene, phenol-based resins, synthetic rubbers and other plastics based on Grangemouth chemicals; use of Grangemouth products for the production of solvents, plasticisers and other industrial chemicals by the D.C.L. Chemical Division; applications of carbon dioxide in Scottish nuclear power stations, welding and foundry work.

### I.C.I. Display

The Nobel, Dyestuffs and Pharmaceuticals Divisions of Imperial Chemical Industries Ltd., who share a stand, all have large-scale plants in Scotland. I.C.I.'s stake in Scottish industry is growing rapidly in size and importance. Recently, another I.C.I. manufacturing

group, the Plastics Division, has announced plans to build a plant at Dumfries for the manufacture of 'Melinex' polyester film.

Nobel Division's fundamental contribution to explosives technology over the years is the theme of the first section. In the chemicals section sulphuric acid, pentaerythritol, nitrocellulose, the Cellofas and Edifas range of cellulose ethers, stearates of copper and aluminium, potassium nitrate, barium nitrate and isopropyl nitrate are featured.

The third section of Nobel Division's exhibit is devoted to I.C.I. silicones.

Vat dyes, produced at Dyestuffs Division's Grangemouth works, form the main feature of this section of the I.C.I. stand. They include Caledon Jade Green, the first green dye really fast to light and washing, which was discovered in 1920 in the Grangemouth laboratories of Scottish Dyes Ltd., later to become part of I.C.I. More recently the Grangemouth works have been actively associated with the development of the Procion range of reactive dyestuffs, introduced by I.C.I. in 1956, which combine chemically with textile fibres.

I.C.I. Pharmaceuticals Division manufactures a wide range of medical and veterinary products, a number at Grangemouth.

### D.S.I.R. Stand

The Department of Scientific and Industrial Research stand features a number of important industrial developments, the work of 16 companies, that have taken place in Scotland. The exhibits tell the story of the research behind these developments, some of which are reviewed below.

### Colclad Structural Steel

For instance, a major step forward in steel technology, the new range of clad steels—Colclad—which give protection

against corrosion at a comparatively low cost, is illustrated. Colvilles Ltd., 195 West George Street, Glasgow C.2, started work on this project just after the war. The bonding process for applying a thin 'skin' of nickel to carbon steel was comparatively easy. The problem with stainless steels or any chromium bearing alloy was, however, more complex. Such alloys have a film of chromium oxide about one molecule thick, sufficient to prevent bonding.

The method of bonding developed by the firm's laboratories is by welding and it requires fabrication and rolling techniques of a special character. A continuous bond is obtained and bend tests with the cladding in tension and compression have shown no sign of separation. It is possible to twist the material through 360° and untwist it without causing any break in the bond.

### Atropine Synthesis May Produce More New Drugs

Latest results of their work on the synthesis of atropine is shown on the D.S.I.R. stand by Duncan Flockhart and Co. Ltd., Wheatfield Road, Edinburgh 11. Their new drug Tropphenium pro-



John Hay Whitney, U.S. Ambassador, studies a diagram of petrochemical activities at Grangemouth on the stand of Distillers Co. Ltd., Industrial Group

duces hypotension (lowered blood pressure) when injected into the blood stream under general anaesthesia during surgery. It is based on the alkaloid atropine; but to achieve uniform quality the firm set out to establish a method of synthesis.

Study of the atropine molecule has shown that it is built up from tropine and once this had been obtained it was comparatively easy to 'amend' it to atropine. After the commercial synthesis of tropine, they progressed to the first successful synthesis of atropine. Their work gave the scientific research team a deep insight into the build-up of the naturally occurring drugs and with this knowledge they began to construct hundreds of new substances.

Now the laboratory is scrutinising the



properties of some of these other new substances; two more are showing promise and have already passed chemical and biological tests; they are now entering clinical tests.

### P.T.F.E. Dry Bearings

**Glacier Metal Co. Ltd.**, Kirksytle, Kilmarnock, are featuring on the D.S.I.R. stand the results of their 10 years of fundamental and applied research into the use of p.t.f.e. for unlubricated bearings. Their work has put Britain ahead in this field and manufacturing rights have already been granted under licence to the U.S. and other countries.

The 'break-through' came when the chemical industry introduced p.t.f.e. in a new form that could be precipitated by the addition of aluminium nitrate to produce a 'mush'. This led to a successful method of impregnating steel-backed sintered porous bronze strip with p.t.f.e., which was then sintered by i.r. radiation.

### Flexible Joints for Pipes

The flexible bellows joints shown by **Munro and Miller Ltd.**, Sighthill, Edinburgh 11, on the D.S.I.R. stand, are the result of a combined research effort—by the firm and a number of outside research organisations. The problem was to find a suitable method of taking up expansion or contraction in piping systems due to temperature fluctuations. To eliminate most of the welding, which could increase the chance of failure, the firm worked on the idea of forming the joints by a special hydraulic process. As a result the joints are made from rolled plate with only one longitudinal seam, ensuring that the product will withstand arduous service conditions, particularly in the atomic energy field.

The bellows are available in a range of metals, including stainless steel, alloy steels, aluminium, copper or titanium.

### Flame-retardant Wood Preservative

Latest product of **Celcure and Chemical Co. Ltd.**, 300 Bearsden Road, Glasgow W.3, a subsidiary of Robinson Dunn and Co. Ltd., shown on the D.S.I.R. stand, is a flame-retardant wood preservative. Pressure impregnated by a special process, it gives complete protection against fungal and insect attack as well as being flame-retardant. In addition to Celcure F, as the product is named, the company has developed a flameproof coating for application by brush or spray.

The company started to manufacture preservatives in 1928, using a copper-chrome formula; Celcure F is the result of investigations carried out in the company's own laboratories.

### New Diaphragm Pump

The newly formed company of **Craig Pumps Ltd.**, Burnfield Road, Giffnock, Glasgow, show their new motor driven diaphragm pump, developed for use in

the chemical and process industries. Pump liquid end is constructed in a special ceramic that is inert to practically all corrosive liquors and resistant to mechanical or thermal shock.

The diaphragm is a reinforced rubber moulding while the valves are of slotted conical type and the valve deck is an accurate rubber moulding. All parts are in acid-resisting rubber, neoprene or Hypalon. The reciprocating drive unit is contained in a cast iron casing that also forms the motor support—all movements are enclosed.

Standard maximum capacity is 350 gall. per hour and standard maximum discharge pressure is 30 p.s.i. The pump is glandless and self priming. Bedplate length is 15½ in., and bedplate width 9 in. Overall length with hose connectors fitted is 20 in.

Among other exhibitors, **Watson, Laidlaw and Co. Ltd.** show centrifugal machines while the **Mirrlees Watson Co. Ltd.** display their scope in condensers and allied plant. **Frederick Braby and Co. Ltd.** feature the Maxim range of distillation plant which they are extending into the larger capacities. **G. and J. Weir Ltd.** also show distillation equipment, while two well-known firms present dust and fume extraction equip-

ment, **James Howden and Co. Ltd.** and **Keith Blackman Ltd.**, Arbroath.

**Wm. Kenyon and Sons Ltd.**, Glasgow, display a wide range of filters, while **Begg, Cousland and Co. Ltd.**, the Glasgow wireworkers, have a display of filters suitable for chemical industry applications. Hose for chemical industry uses is shown by **Atholl Asbestos** and **George MacLellan and Co. Ltd.**

**William Kenyon and Sons** show Scottish diatomite in its various applications while **Rocksil**, made in Scotland by the **Cape Asbestos Co. Ltd.** is also featured. New development here is their barrier mat type of **Rocksil** in which a vapour seal is achieved by bonding a plastic to the normal insulation material.

**Flexible Ducting Ltd.** who make flexible hoses for a variety of industries have also chemical industry applications pending. **Glenfield and Kennedy** are well known in the water engineering field and their micro strainers are also finding applications in other industries including papermaking and chemical engineering.

Fertilisers are covered by **Colvilles Ltd.**, **William Kenyon and Sons** and by **Alexander Lister and Son Ltd.**, Rothesay. **British Oxygen Gases Ltd.** cover the full applications of commercial and medical gases while **B. Palso** feature chemical gases.

## Travel Firm Offers £225 Nine-day Visit to New York Chemical Fair

AN 'all-in fee' of £225 is being quoted by a London travel company for those wishing to attend the 27th Exposition of Chemical Industries in New York later this year. This fee covers a nine-day tour comprising return air reservations by Pan American Boeing jet airliner and hotel accommodation consisting of dinner, bed and breakfast in a well-known Central New York hotel. Also included is transfer between airport and the New York hotel in both directions.

Travel across the Atlantic will be by normal scheduled service flights and those taking part will be able to extend their stay in the U.S. at the end of the tour, as their air tickets will be valid for return by any Pan American service within 12 months. If required, arrangements can be made for travel by either De-luxe, first or tourist class; additional hotel accommodation and other facilities can be arranged on demand.

CHEMICAL AGE readers interested in this tour should contact Mr. D. J. Lloyd Davies, director, Ashton and Mitchell Travel Ltd., 2 Old Bond Street, London W.1 (Mayfair 7222) for full details. Exposition badges and other documents will be issued before departure from London. In addition, the company will also arrange for introductions to trade associations and companies, and will advise on currency, health regulations, visas, etc.

The exposition is being held at the Coliseum, New York, from 30 November to 4 December. At the last exhibition, held in 1957, there were more

than 36,000 individual registrations including 750 overseas visitors. Products on display will include process equipment, instruments, chemicals and raw materials, laboratory equipment and supplies, material handling equipment, packaging equipment and products.

### Araldite Ducting for Sulphuric Acid



**Parglass Ltd.**, Bristol, have used CIBA (A.R.L.) Ltd.'s Araldite epoxy resin in conjunction with woven roving glass cloth to provide reinforced plastics ducting for the National Smelting Co.'s sulphuric acid plant at Avonmouth. This ducting carries sulphur dioxide fumes at temperatures of about 60°C; Araldite X83/8 with glass cloth was selected for maximum corrosion resistance.



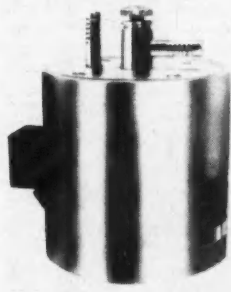
**DRUM STORAGE UNIT**

A NEWLY designed drum pallet by **Powell and Co.,** Burry Port, Carmar, South Wales, is constructed throughout with rectangular section hollow steel tubing. There are no crevices to hold moisture and it is therefore very suitable for use both outdoors and indoors. Each unit carries three drums of 40/50 gall. and is handled by means of a fork lift truck, the fork clearance being 2½ in. deep.

Although strong enough to permit tiering four high, each unit is light enough for one man to carry. The units are symmetrical and reversible and, being very compact, permit safe and close packing of drums in the minimum possible space.

**SINGLETON SMALL INDUSTRIAL PUMP**

A NEW pump designed by **Singleton Bros. (Instruments) Ltd.,** Eppingham, Surrey, is basically a vibrator type of miniature size and so designed that it can be set to give the performance desired by the user. It is adaptable to a wide variety of technical



Singleton miniature pump is shown half actual size

operations, both as a component built into equipment and in laboratories.

The pump can be supplied in either a metal or Bakelite cylindrical case and is particularly compact. The metal case model is 2½ in. long by 2½ in. diameter, and it weighs 24 oz. The Bakelite cased model is 3½ in. long, 3½ in. in diameter and weighs 30 oz. The wide range available gives positive or negative pressure in closed or open circuit. They are suitable for liquids or gases, including corrosive gases. Prices range from £5 5s.

**AUTOMATIC WEIGHT CONTROL**

TO MEET a growing demand, **Elcontrol Ltd.,** Wilbury Way, Hitchin, Herts, have recently developed an automatic weighing control equipment. It is intended for heavy industrial use for the bulk handling of liquids and solids. This equipment involves the use of one, two or three load cells on which the load, e.g., hopper, conveyor section, truck or loading platform—is supported.

The load cells are connected to a remote relay unit which integrates the output from the cells. The integrated output current is monitored and when it reaches a value corresponding to the

# EQUIPMENT NEWS

## Chemical Plant : Laboratory Equipment : Control and Indicating Apparatus

selected operating weight, the relay in the control unit is operated and actuates the control mechanism.

It can also be supplied in a flame-proof version. The equipment is suitable for a range of weights from 50 lb. to 1,000 tons or more.

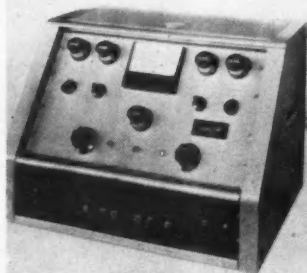
**HEARSON'S QUADRATE OVEN**

THE new Quadrate oven has been designed by **Charles Hearson and Co. Ltd.,** 68 Willow Walk, London S.E.1, to meet the needs of teaching and industrial laboratories. Of modern appearance, it is robustly constructed, and has excellent performance characteristics up to a temperature of 200°C. The liner is of welded mild-steel, rust-proofed and finished matt black. Outer case is of mild steel, welded construction, rust-proofed and finished in hammer pattern silver-grey stove-enamel.

Heat-breaks are situated between the liner and the outer case, and the inner and outer faces of the door. A soft asbestos gasket is used as a seal between the door and the faces of the liner. Two shelves are supplied. Working space measures 12 in. by 12 in. by 12 in. and the oven is 21 in. high by 17½ in. wide and 16 in. deep.

**ANALOGUE COMPUTER FOR G.L.C.**

A NEW contribution to gas chromatographic analysis is an analogue computer announced by **Podbielniak Inc.,** 341 East Ohio Street, Chicago 11, U.S., to speed up time of analysis. It is claimed that the Computagram makes it possible to calculate a complete analysis in less than three minutes. Calculated percentages are accurate to within 0.1%. The computer corrects peak areas or peak heights for differences in the response of the detector and normalises the corrected areas or heights to total 100, thereby giving the per cent (mole or



Analogue computer

weight according to correction factors inserted) of each individual component.

Computagrams are available in three

models, differing only in the number of components which they can handle. Series 4075-4 is designed for simple mixtures having four or less components, such as liquefied petroleum gases. Models 4075-8 and 4075-12 are designed to handle up to eight or 12 components.

**VIBRATION DAMPER FOR COMPRESSED GASES**

THE venturi vibration damper developed by the Chemical Engineering Division of **W. C. Holmes and Co. Ltd.,** Turnbridge, Huddersfield, has been designed to elim-



Holmes venturi vibration damper unit

inate vibrations in compressed gases due to pressure fluctuations produced by reciprocating or lobe type compressors.

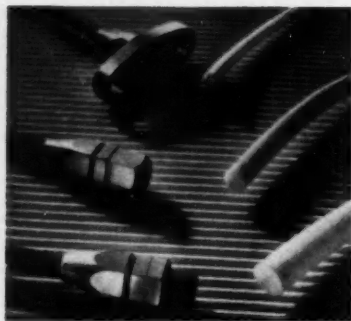
Pressure fluctuations of this type can set up sympathetic vibrations in pipelines, in pipe supports and in such plant as after-coolers, often with disastrous results.

The theory on which the venturi is based is that the pressure fluctuations are high velocity movements in the gas, and by bringing the whole of the gas up to or approaching the velocity of the pressure fluctuations, and subsequently reducing the velocity again, some or all of the fluctuations are eliminated.

Using a venturi the kinetic energy of the gas can be recovered almost completely, thus reducing the pressure loss which would otherwise be involved.

**NEW RANGE OF P.T.F.E. FLEXIBLE HOSE**

A NEW range of flexible p.t.f.e. flexible hoses embodying a patented re-usable end connection has been developed by **William Rose Ltd.,** Hilyn Works, Lock-



P.t.f.e. hoses by Wm. Rose

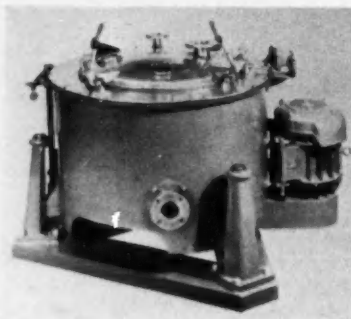
field Avenue, Brimsdown, Middlesex. The tubing will convey a multitude of liquids and is resistant to most known chemicals including acids and corrosives. The tube is usually protected with closely woven wire braiding; asbestos sheath for insulation can also be provided.

P.t.f.e. hoses possess a wide working temperature range of  $-80^{\circ}\text{C}$  ( $-176^{\circ}\text{F}$ ) to  $250^{\circ}\text{C}$  ( $485^{\circ}\text{F}$ ) although under certain circumstances it can remain serviceable at temperatures as high as  $300^{\circ}\text{C}$  ( $572^{\circ}\text{F}$ ). Throughout the whole temperature range it retains its inherent toughness and has exceptional weathering qualities being impervious to steam and water. Pressures depend on the bore size required; for example on a  $\frac{1}{2}$ -in. bore hose, a working pressure of 5,000 p.s.i. can be achieved, while a 1-in. bore will give up to 2,500 p.s.i. At the expense of flexibility, very high pressures can be achieved by multi-braiding and some hose assemblies have reached 20,000 p.s.i. Tube and rod from  $\frac{1}{8}$  in. up to 1-in. bore can be provided, while sizes above this limit can be specially produced.

#### GOODENOUGH CHEMICAL CENTRIFUGE

A STRONG well-balanced centrifuge capable of maintaining high production output with the large capacity machine, or alternatively small batch quantities with the smaller sizes, has been introduced by **Power Installations Ltd.**, Barge Street, Leicester. Manufactured in the following sizes: 18 in., 21 in., 26 in., 30 in., 36 in., 42 in., 48 in., 54 in., and 60 in. diameter (basket sizes) they give a net capacity range of from 0.75 cu. ft. to 15 cu. ft.

The basic machine consists of bed-plate, suspension columns, pendulum



Stainless steel centrifuge

suspension and outer casing, all constructed in mild steel. The centre-piece of cast iron houses a high tensile steel spindle set in ball bearings. The Vee-belt brake is of the spring compression type, with a Ferodo lined brake band. Once applied it is completely automatic and the current is cut off.

All contact parts are of stainless steel to resist chemical corrosion. Filter strip retaining rings can be fitted inside the basket. The drive unit is a special high torque electric motor, either totally enclosed fan-cooled type or flame and explosion-proof fan-cooled type.

A less expensive version can be supplied, substituting mild steel lined with  $\frac{1}{8}$  in. thick hard vulcanite for stainless steel. The lining can be specified to withstand the particular chemicals to be centrifuged.

#### SHAW HYGROMETER ALARM

THE new Shaw hygrometer by **Shaw Moisture Meters**, 31 Market Street, Bradford, is said to be so sensitive that it will detect one part of water vapour per million parts of dry air or gas. It will also operate under high pressure, temperature or humidity conditions. The simple instruments now announced give immediate and continuous indication of the humidity of even the most dry gases.

The sensing of moisture is done by a new type of small element. As the sensing device is in the form of a variable capacitance, contamination does not present difficulties.

This new hygrometer with an immediate response, stable characteristics and provision for easy checking and standardising as well as remote reading, will, it is claimed, indicate the humidity of drying ovens of both laboratory and industrial types; indicate the difference in % R.H. between dry silica gel and  $\text{P}_2\text{O}_5$ ; indicate in less than a second the difference in humidity at ground level and that at 4 ft. above. The instrument is available in the following versions: indicating; recording; recording and controlling; and adjustable humidity alarm.

Firms wishing to try the Shaw hygrometer may rent one for a month (£12), the rent being deducted from the price if purchased (recording model £5 per week).

#### FULLY AUTOMATIC SCALES

THE range of ASE fully automatic laboratory scales marketed by **Shandon Scientific Co. Ltd.**, 6 Cromwell Place, London S.W.7, has been widened to include larger capacity models for industrial purposes.

The readability of the scales is achieved by a system of shuttered indicators which enable the pointer to make five revolutions of the dial to cover the instrument's full range, equivalent to a reading line of some 13 ft. The graduation divisions are about  $1/16$  in. apart, and the scale can easily be read to half a division. On the  $2\frac{1}{2}$  kg. (5 lb.) model, for example, each division represents 1 gramme ( $1/16$  oz.) so that it may be read, instantly and accurately, to  $\frac{1}{2}$  gramme ( $1/32$  oz.).

Correspondingly close readings are possible on the larger models.

A quick tare device is available, enabling containers weighing up to one-fifth of the instruments' total capacity, to be tared instantly by turning a knob.

Five basic models are available offering capacities of  $2\frac{1}{2}$  kg. ( $5\frac{1}{2}$  lb.) to 500 kg. (1,000 lb.).

#### SEMI-RIGID POLYTHENE LINER

To carry viscous materials, particularly those of a corrosive nature, the Duokask has been developed by **Bowater-Eburite Bulk Packaging Ltd.**, Fibre Drum Division, Bowater House, Knightsbridge, London S.W.1. It has a smooth semi-rigid polythene liner that can be removed for washing and can be fitted into a new Supakask should the need arise. The metal lid is protected by a vacuum-formed polythene disc, thus making the internal surface entirely polythene covered. In the rim of the lid is a dense rubber gasket and when the lid is clamped onto the drum by a lever action closing ring this ensures a leak-proof seal.

The Duokask is available in five sizes—6, 10, 12, 25 and 45 gall. The thickness of the polythene allows for stirring in case of phase separation.

#### VERTICAL GLANDLESS PUMP

A SERIES of pumps designed for use with spent liquor is intended primarily for circulating rayon spin bath liquor in high vacuum crystallisers (for the purpose of recovery) and for forced circulation evaporators handling caustic soda from electrolytic cells, but has other applications.

The pump, designed and made by the **Kestner Evaporator and Engineering Co. Ltd.**, is of the axial flow propeller type provided with guide vanes on both suction and delivery sides. The shaft is in mild steel sheathed in antimonial lead in the form of an homogeneous coating, and other sleeves in silicon iron provide anti-corrosion protection towards the bottom of the shaft. The pump body is made from regulus metal and the guide vanes, which also serve to sleeve the pump casing, are made from Tanton. Steaming out points are provided.

The pump has no gland or bearing in contact with the liquor being pumped. It can be arranged to operate in two ways. In one arrangement a supply of 'sealing' liquor may be fed into a chamber adjacent to the sealing sleeve and led away through a branch. Alternatively the liquor effects its own seal when that branch is blanked off.

#### ACCURATE TEMPERATURE CONTROLLER

CO-OPERATION between the laboratories of **United Steels, Ltd.**, of Rotherham, and **Winston Electronics Ltd.**, Shepperton, Middx, has resulted in the commercial production of an extremely accurate commercial temperature controller of robust construction. The Winston-

United Steels temperature controller type M.226, is said to control to the close limits of  $\pm 0.025^\circ\text{C}$  at  $1,000^\circ\text{C}$  or above, for months and years continuously.

The direct calibration of operating temperatures is possible through the use of improved multi-turn potentiometers. The furnace switching relay has no other circuit function to perform and so avoids the critical adjustment of a normally troublesome component.

#### ROTARY ELECTRIC VIBRATOR

A NEW design of rotary electric vibrator has been introduced by **Sinex Engineering Co. Ltd.**, of North Feltham Trading Estate, Feltham, Middlesex, for use as a power unit in such equipment as feeders, conveyors, screens, knock-out beams and grids for foundries, compacting tables, shutter vibrators and in the discharge of material from storage hoppers.

The four sizes provide centrifugal forces of 300, 500, 1,960 and 7,600 lb. respectively. These figures relate to running at the standard synchronous speed of 3,000 r.p.m. Vibrators running at 1,500 r.p.m. (for handling or compacting certain difficult materials or providing larger centrifugal effects) can be built to special order. Special windings other than the standard 440 V 3-phase can also be provided. The cable entry is normally tapped  $\frac{1}{4}$  in. e.t. and supplied without a gland.

#### UNIT TEMPERATURE AND HUMIDITY CONTROLS

EQUIPMENT in unit form for control of both temperature and humidity suitable for laboratory and test room requirements is being marketed by **P. M. Walker and Co. (Halifax) Ltd.**, Hopwood Lane, Halifax, Yorks. These units consist of a Westair air conditioner which filters, heats and cools to predetermined temperatures fresh air, prior to discharge into the room. At the same time these units extract some room air, giving a specific number of air changes. The air conditioner governs air temperature and can be supplied for fully automatic operation or for hand control. It is simple to install and is usually sited through a wall or window. Controlled humidity is provided jointly by an 'Aerosol Turbo' laboratory model humidifying unit, which is used where an increase in moisture is required, and a dehumidifying unit working on the refrigeration principle, for a reduction in moisture content.

#### PORTABLE SPARK TESTER

THE Gee-Bee portable spark tester, model GBP 20, has been designed by **Goodburn Plastics Ltd.**, Arundel Road, Trading Estate, Uxbridge, Middx, to suit conditions in workshops engaged in lining vessels and tanks with rubber, neoprene and plasticised p.v.c. sheet. The tester has a moulded polythene housing that will not fracture or split if the apparatus is accidentally dropped.

High frequency coil of the instrument

is housed in a separate unit which can be plugged into the spark tester with a three-pin plug. High frequency output can be adjusted by means of a knob and the instrument can be used for 220/230 volts mains and for 110/115 volts mains. The tester can be fitted with a flexible probe or a comb-type electrode, the latter being preferred for the testing of large surfaces for pinholes. A trigger in the handle enables the tester to be operated.

#### CENTRALISED LEVEL CONTROL

A DEVELOPMENT of the Tektor minor level controller of **Fielden Electronics Ltd.**, Wythenshaw, Manchester, enables up to 150 ft. of coaxial cable to be used between probe and unit. Multiple construction of electronic units enables centralised or grouped indication of level.

A single Tektor consists of a probe connected to an electronic unit, the probe being installed on the container. The increase in interconnecting cable length means that the unit may be conveniently situated at ground level for ease of access or maintenance. If centralised level control is required this extension of cable length enables all electronic units to be brought together from different parts of the plant and housed in one case. Only one mains supply cable need be run to the multiple unit.

#### LEAD BRICKS FOR ATOMIC SHIELDING

A NEW lead brick for use in shielding personnel against gamma, beta and alpha rays has been produced by a special 'pressure moulding' technique by **British Lead Mills Ltd.**, Stornoway House, Cleveland Row, London, S.W.1. a member of the Firth Cleveland Group. After close liaison with Harwell a pressure-moulded lead

brick was produced by the company at Welwyn Garden City. This brick was accepted by Harwell as a standard for all future requirements. Pressure moulding is said to ensure the greatest density and freedom from porosity and inclusions within the fine limits permissible under Harwell's rigid specification.

The B.L.M. pressure moulded lead bricks are produced in 2 in. and 4 in. thicknesses in the form of standard, corner, top and bottom bricks, also half or even quarter bricks which can be built up into a complete surround by virtue of their interlocking nature, to give the maximum thickness at any point of 2 in. or 4 in. or multiples thereof.

Harwell have signed a two-year contract with British Lead Mills for these pressure-moulded lead bricks, which are adaptable for portable and permanent lead shielding.

#### AIR FILTER REGULATOR

THE new No. 77 Mason Neilan air filter regulator set introduced by **Crosby Valve and Engineering Co. Ltd.**, Ealing Road, Wembley, comprises a large capacity dripwell, porous ceramic cartridge type filter, accurate pressure reducing valve and safety relief valve. The body is of die-cast aluminium with two mounting bolt holes. An outlet pressure gauge can be supplied fitted when necessary and if necessary the outlet connection can be orientated in three alternative positions.

Elimination of alignment problems has resulted in a remarkably flat pressure/flow curve over a very wide range. The set can be supplied with or without outlet and/or inlet pressure gauges. The maximum inlet pressure is 250 p.s.i.; reducing pressure range is 5-40 p.s.i.; inlet and outlet connections screwed female; weight is  $2\frac{1}{2}$  lb., and overall height  $8\frac{1}{2}$  in.

## Extruded Chlorinated Polyether Introduced by Polypenco

A NEW chemically inert thermoplastic material, K.51—a chlorinated polyether derived from pentaerythritol—has been added to the range of engineering plastics of Polypenco Ltd., 68-70 Tewin Road, Welwyn Garden City. The new plastics possesses an unusual combination of properties for a thermoplastic, including excellent mechanical strength, high temperature resistance, exceptional chemical resistance and good dimensional stability.

Polypenco K.51 is said to be inert to almost all alkalis, solvents, chlorides, and inorganic acids. This degree of inertness together with its mechanical strength and heat resistance, makes K.51 of particular interest to the chemical industry for such applications as bearings, valve seats, seals, gaskets, washers, impellers and other parts operating under severe corrosive condition. K.51 is also completely non-hygroscopic and has excellent outdoor

weatherability.

A comparatively rigid form stable material, K.51 has a tensile strength of 6,000 p.s.i. and a Rockwell hardness of R100. It has high resistance to deformation under load and low cold flow tendency compared with fluorocarbons. As a result, finished parts are structurally tough and durable. The wear and abrasive resistance properties of this material are also good. While K.51 heat distortion temperature is in the same general range as nylon 66, it can be subjected to continuous operating temperatures from  $120-130^\circ\text{C}$  in an oxidising atmosphere. K.51 possesses good electrical insulating properties and as a dielectric its loss factor is low over a wide frequency range.

This new material is available in a wide range of extruded shapes which are readily machineable into component parts on conventional metalworking equipment.



## Cambridge Congress Paper on Polarography of iso-Benzpyrylium

TO solve problems met in the degradation of dimeric propenyl-phenol ethers the polarographic behaviour of iso-benzpyrylium salts obtained from substituted 2-aryl- $\alpha$ -ethyl-arylacetonones with mineral acids has been investigated by Dr. M. Vajda, Institute of Organic Chemistry, University Eötvös Loránd, Budapest.

Vajda and his co-workers have found that all iso-benzpyrylium salts gave a one electron wave in strongly acid buffered solutions and in solutions of sulphuric acid. On studying the effect of the pH of the solutions they found that in the case of salts without hydroxyl substituent at pH values characteristic for the specific salt under investigation a second wave forms and the first wave diminishes in height, the sum of the two waves remaining constant. These waves are ascribed to the reduction of the iso-benzpyrylium ion and the undissociated pseudo-base respectively. From the rela-

tive wave height of the first and second waves plotted against the pH values the dissociation curve and the 'polarographic' dissociation constants were obtained.

In the case of salts with free hydroxylic substituents the second wave cannot be observed, and an anodic wave appears concurrently with the lowering of the wave height of the first wave. The appearance of the anodic wave coincides with the appearance of a reddish purple colour in the hitherto yellow solution. Vajda supposes that the anodic wave and the purple colour are due to the formation of a phenolic inner salt, as the other possibility of a quinoid structure can be excluded, because no reduction wave can be obtained from purple coloured solutions.

Investigations regarding the relation between substitution and dissociation constants and half-wave potentials are in progress, parallel with synthetic work in this field.

## Boron Carbide and Graphite Paste Electrodes in Voltametry

INCREASED interest in voltametry at solid electrodes has led to the investigation of materials other than platinum and gold as working electrodes. Because of their inherently low charging current characteristics and wide range of anodic utility, solid electrodes are considered to offer marked advantages over the dropping mercury electrode.

Reporting to the congress on their work on boron carbide and graphite paste electrodes in voltametry, Dr. Theodore R. Mueller, Dr. Carter L. Olson and Professor Ralph W. Adams, Department of Chemistry, University of Kansas, Lawrence, Kansas, U.S., indicated that boron carbide electrodes apparently do not exhibit the complications associated with surface oxidation of noble metals, while graphite paste electrodes have been developed which are much easier to prepare and considerably more practical than carbon rods for routine analysis.

In acid media B<sub>4</sub>C has a usable polarographic range of about -1.0 to +1.0V vs. SCE, with essentially no residual current. In basic solutions, this range is -1.4 to +0.6V. Oxidations and reductions of organic and inorganic species have been achieved with high precision. The  $E_1$  values, Mueller *et al.* report, agree well with results obtained with platinum electrodes.

The graphite paste electrodes are made by simple hand mixing of powdered graphite and various organic liquids. The paste can be used in a pool configuration as a substitute for carbon rod electrodes. The peak type polarograms obtained have excellent sensitivity and reproducibility and are remarkably free of extraneous currents, these investigators claim. A wide spectrum of oxidations and reductions has been carried out with this electrode.

## Identifying Chromone and its Derivatives

IT was found by Dr. E. Knobloch, Pharmaceutical and Biochemical Research Institute, Prague, that chromone and its derivatives, besides the normal two-electron cathodic wave, show in acid-buffered solutions a catalytic wave due to the deposition of hydrogen. The latter wave is accompanied by a sharp maximum and is similar to that observed with the pyridine derivatives and it is assumed that the catalytic effect is caused by the heterocyclic oxygen forming in acidic medium an oxonium ion functioning as a proton donor, similar to the pyridinium ion. In contrast to the chromone deriva-

tives the catalytic effect is not observed with the analogous coumarine derivatives in which the heterocyclic oxygen possesses a lower basicity.

This different polarographic behaviour (the catalytic effect) can be used in the identification of both kinds of derivatives. The method has been successfully applied to distinguish 2-methoxychromone from 4-methoxycoumarine as well as to prove the existence of isomeric *o,o*-dimethoxy derivatives of pelentan ethyl ester of the 4-hydroxycoumarinyl 3-acetic acid which before methylation occurred in a tautomeric equilibrium.

## B.C.U.R.A Work with Organic Solvents

Some generalisations have been drawn by Dr. P. H. Given and M. E. Peover, British Coal Utilisation Research Association Leatherhead, from the results of recent polarographic studies using dimethylformamide and other organic solvents. In particular, the rôle of proton addition in determining the mechanism, reversibility and extent of reduction is stressed.

Phenol, they state, gives no hydrogen discharge wave in dimethylformamide but is an effective proton donor at all accessible potentials. In its presence aromatic hydrocarbons and carbonyl compounds show a wide variety of behaviour: half-wave potentials and wave heights are altered in a way that throws light on mechanisms of reduction; anthraquinone can be reduced to 9:10-dihydroanthracene. It is probable that when phenol and benzoic acid are used as proton donors, it is the undissociated acid, not the solvated proton, that is effective.

## A. C. Polarography of Chelate Complexed Metallic Ions

One of the advantages that a.c. polarography possesses is the separation of kinetic current from diffusion controlled current. In polarography usually many kinds of supporting electrolyte are used, which produce strongly complexed ions with metallic ions. The behaviour of metallic ions, such as Cd, In, Zn, Ni, W, Ti, Mo, etc., in some supporting electrolytes (phosphoric acid, potassium halide or thiocyanate) was therefore studied by the a.c. polarographic method by Dr. Eiji Niki, Aeronautical Research Institute, Tokyo University, Japan.

As a result it was found that the technique of a.c. polarography using an a.c. bridge polarograph overcame the uncertainty involved in a.c. polarographic waves, provided that suitable complex-formation of supporting electrolyte with metallic ion was performed.

According to the experiments using a.c. polarography on chelate compounds such as the complexes of Cd, Cu, Pb, Zn, Fe ions with EDTA, the effect of kinetic current due to the dissociation of the chelate compounds accompanied with the diffusion current is small in an a.c. polarograph.

## Reagent for Fluoride Ions

Reported to be twice as sensitive as 1:10-phenanthroline in the colorimetric determination of iron, 4:7-diphenyl-1:10-phenanthroline (*Analyst*, 1958, 83, 30) is now available from Hopkin and Williams Ltd., Chadwell Heath, Essex. This reagent is also known as batho-phenanthroline.

Another new product in Hopkin and Williams' range of fine chemicals for analysis is the new colour-producing reagent for fluoride ions, 3-aminomethylalizarin-N,N'-diacetic acid. This reagent was described by Belcher, Leonard and West (*Talanta*, 1959, 2, 92).



## Overseas News

### NEW U.S. ROUTE TO TITANIUM BASED ON ELECTROLYSIS OF TITANIUM CARBIDE

OBTAINING titanium comparable in purity and physical properties to current commercial metal by electrolysis of titanium carbide in a fused salt, appears to hold considerable promise as a commercial process. Laboratory investigations have been carried out by Norton Co., Worcester, Mass., and in one pass, they report, titanium is produced of about 99.6% purity, with hardness on the Brinell scale of 157. Main impurities are iron, carbon, oxygen and nitrogen. A further pass would improve the above values.

Advantage of the process lies in using titanium carbide as a starting material. It is commercially available, and is similar in cost to titanium tetrachloride, yet it contains about three times as much titanium.

According to Norton, titanium carbide during electrolysis acts like titanium metal with a high carbon content. They consider that their process could probably compete economically with the Kroll process, where titanium tetrachloride is reduced to the metal with magnesium. There are possibilities, too, that since other metal carbides probably have the same property, they could be made by this process as well.

#### Hoechst to Use Acetaldehyde from Ethylene Process

Two acetaldehyde units being built by Farbwerke Hoechst AG, near Cologne and near Frankfurt, will use the recently patented acetaldehyde-from-ethylene process developed by Consortium fuer Elektrochemische Industrie GmbH, a Hoechst affiliate. In the process ethylene is increased directly to acetaldehyde using a platinum catalyst (a platinum compound in solution). Oxygen, air or an oxygen donor can be used as the oxygen source.

The reaction is carried out cyclically at temperatures near 100°C and at moderate excess pressure. Ethylene is converted to acetaldehyde with yields of more than 90% per pass. The acetaldehyde is separated from the reactor exit scheme in a wash tower.

Advantages claimed for the process are use of cheap raw materials—air and an ethylene-rich gas stream, e.g., from a refinery. The same technique could be used to produce methyl ethyl ketone and acetone from *n*-butene and propylene.

#### Two East German Sulphuric Acid Plants

Two projects of the East German Government, a zinc blende roasting plant and a catalytic plant, for the manufacture of sulphuric acid from Freiberg zinc blende and Elbingerode pyrites, are to be completed and brought into operation next month, it is stated from East Berlin.

Total output will be an estimated 9,000 tonnes annually.

#### Aluminium Sulphate Plant for S. Rhodesia

A plant for the manufacture of aluminium sulphate is under construction in Southern Rhodesia by African Explosives and Chemical Industries (Rhodesia) Ltd. Production of the chemical, for which Rhodesia at present spends some £50,000 a year on imports, will start during the course of this year.

#### Fertiliser Plants for Spain

Two Spanish companies—Refineria de Petróleos de Escombreras S.A. and Abonos Sevilla S.A.—have been granted a total of \$17,620,000 by the Export-Import Bank for the purchase of plant and equipment for synthetic fertiliser factories. The first-named company will receive \$10 million of this total and Abonos Sevilla the rest.

#### Sudan Chemical Plant Begins Production

Sudanese Chemical Industries are to open their Sudan production plant next month with initial annual production worth £\$500,000. The company will manufacture sulphonamides, penicillin, aspirin and various vitamins. Annual production will later be stepped up to £\$4 million worth of products annually.

#### Sulphuric Acid Plant

Thai Chemicals Co. Ltd. and Chung Hwa Industrial Works of Formosa have signed a joint-investment contract for a sulphuric acid plant to be built in Thailand (Siam).

#### Major U.S. Plastics Producers to Increase Output

Two U.S. major chemical producers, Du Pont and Union Carbide, are to increase their plastics output yet further. Du Pont are at the beginning of next year to bring into operation extended plant at Circleville, Ohio, for the production of their Mylar polyester film, at the same time opening new laboratories and administration buildings there. A totally new Mylar film production unit will be opened in 1961 at Florence, South Carolina. Union Carbide have just brought on stream their new plant at Whiting, Indiana, for the production of high-pressure polythene, thus raising their combined polythene capacity to over 400 million lb. per year.

#### Cyanamid Award Contract for Nitric Acid Plant

Cyanamid of Canada Ltd. have awarded a contract for design and construction of facilities to increase nitric acid production at their Welland,

Ontario, plant. The new plant, to be built by G. McKee and Co. of Canada Ltd., Toronto, will be the largest single nitric acid unit so far erected in Canada. Completion is scheduled for 1960.

#### Japan-U.S. Agreement on Vinylon Know-how

Kurashiki Rayon Co. are reported to have reached an agreement with Air Reduction Corporation of America to provide the latter with technical data for the manufacture of Vinylon. Motor tyres made of Vinylon cord are reported to have been successfully tested by Dai Nippon Spinning Co. and Otsu Rubber Co.

#### Jordan Potash Plant Ready Soon

A pilot potash plant being built at the northern end of the Dead Sea for the Arab Potash Co., by the West German firm Chemibau, is expected to be working by the end of the year with an annual output of 5,000 tons. The solar pans are finished and sea water is being pumped in.

#### PVP Capacity will Increase in U.S.

Polyvinylpyrrolidone (p.v.p.) capacity in the U.S. is expected to increase early in 1960. General Aniline and Film Corporation's dyestuffs and chemical division are incorporating several recent processing techniques and re-engineering their acetylene-derivatives plant at Calvert City, Ky., U.S. At present, the \$6 million plant which went on stream in 1956 to produce multimillion-pound quantities of p.v.p. and associated compounds, is the only full-scale plant producing acetylene chemicals using Reppe chemistry. Handling the process modifications for General Aniline are Lummus Co.

Interference of present p.v.p. production will be avoided.

#### Bayer to Increase Dralon Production

Farbenfabriken Bayer AG, Leverkusen, are to increase their output of Dralon (acrylic) fibre. In the current year a capacity of 10,000 tonnes of Dralon will have been reached, and by 1961 this will have been increased to as high a capacity as 25,000 tonnes per year.

#### Israel Research in Organometallics

As part of its programme for the expansion of chemical industry in Israel, the Israeli Ministry of Commerce and Industry is sponsoring the Technion, Israel Institute of Technology, Haifa, in its extensive research project on organometallic compounds.

#### Indian Sulphuric and Ammonia Plants on Stream Soon

A sulphuric acid plant at Bhilai, India, which will produce about 12,000 tons of acid a year, is expected to be completed shortly. The acid will be used to produce ammonium sulphate from ammonia recovered as by-product from coke-oven

gases. The plant for the conversion of ammonia into ammonium sulphate is also scheduled for commissioning in the next few months.

### Union Carbide not to take up Aviso Rayon Unit

Union Carbide have now decided not to exercise their option on American Viscose's rayon plant at Roanoke, Va. A further study of their textile programme revealed that the company would be unwise to take up the option.

### Dow of Canada to Produce Expandable Polystyrene Pellets

Dow Chemical of Canada are to start production of polystyrene expandable pellets. At the same time capacity of the plant to produce polystyrene foam, Styrospan, will be doubled. Expandable pellets have been under pilot plant development by Dow scientists at Sarnia. When heated the pellets form a smooth foam which is both rigid and extremely light in weight.

### Czech Chemical Imports

The Czech Government has issued details of the country's major participation in the world chemical industry last year. Over the year, it is stated, the State chemical import corporation, Chemapo, bought organic chemicals, plastics and natural tannins from abroad for a total worth of about 4 million Czech crowns. Successful barter deals in this field were concluded in particular with Austria, Switzerland and Holland. Czechoslovakia's own speciality chemicals, aniline dyes, were exported for a total value of some 22½ million crowns.

### Maruzen Oil's Provisional Contract with Scientific Design

Signing of a provisional contract with Scientific Design Co. of New York is announced by Maruzen Oil Co., Japan, whereby Maruzen will provide technical assistance for the manufacture of butyl-methyl ketone, using their own process. The contract is said to be for 10 years, calling for a down payment of \$10,000 and 3½% royalty on sales.

### Another Pharmaceutical Company for Thailand

Thailand's Ministry of Industry has signed an agreement with Dumex Ltd. of Denmark for the setting up of a pharmaceutical factory. Construction is expected to start soon, and production will begin early next year. It is hoped that in time this company and Merck Sharp and Dohme (CHEMICAL AGE, 15 August, p. 133) will produce sufficient pharmaceuticals to meet local requirements of the lines manufactured (antibiotics, vitamins, steroids, diuretics, etc.).

### A.E.C. \$1.5 M. Contract for Sodium Reactor Design

U.S. Atomic Energy Commission has awarded a \$1,565,000 contract to ALCO Products, Inc., Schenectady, N.Y., for the final design and fabrication of a sodium-to-sodium heat exchanger and a sodium-to-water steam generator. This contract

follows an initial award to ALCO last year for the preliminary design of heat exchanger components for sodium-cooled nuclear power plants. Under the second-stage contract just awarded, the company will follow up its preliminary work with research and development, and final design and manufacture of the prototype units.

### Congo Government's Interest in Pyrethrum Extraction

Plants for extraction of pyrethrum are to be established by the Congo Government; to date the dried flowers have all been exported. To ensure quality control, extracted pyrethrum is subject to export licensing. Licences are issued by L'Office des Produits Agricoles du Kivu at Bukavu and Goma in the Eastern Congo. An export tax for revenue purposes of B.C. frs.67.50 per 10 kg. or part thereof has been approved by the Collège Consultatif.

### New Catalyst for Epoxy Resins

A new catalyst for epoxy-resins and possibly for high-efficiency fuels is announced by the U.S. company Union Carbide. The chemical—an amine—is N.N.N.'N'-tetramethyl-1,3-butane-diamine.

### Israeli Chemical Plant Developments

It is reported that a calcium carbide plant has been inaugurated in Petah Tikvah, Israel. The plant, which cost £1.5 million, is scheduled to produce

10,000 tons of calcium carbide annually. Two-thirds of the expected output is earmarked for export.

Erection of a plant for production of polyethylene at a cost of £110 to 15 million has been strongly recommended to the Israeli Ministry of Commerce and Industry by a U.S. industrial expert.

### New Sulphuric Acid Plant for China

A new sulphuric acid works has begun production in Sining, Chinghai Province. A second is to be built there later this year. The first phase of construction of the Szechwan Chemical Works, Kintang County, near Chengtu, is nearly complete. This will provide an annual capacity of 240,000 tons of sulphuric acid, 290,000 tons of ammonium sulphate and 55 tons of ammonium nitrate.

### West Germany's Higher Chemical Investments

In 1958 the West German chemical industry invested a total of DM.1,600 million (about £134 million). This compares with investment figure for both the previous year and 1956 of DM.1,500 million (£125 million). Some 9.3% of total turnover was invested last year, as against 8.7% in 1957 and 9.6% in 1956. According to estimates, investments in the current year will be at last year's levels. Some 58% of all investments last year were for machinery and plant.

## New U.S. Process for Methyl Esters of Fatty Acids from Low-value Soapstock

RESEARCH by the Southern Regional Research Laboratory of the U.S. Department of Agriculture at New Orleans, La., has led to a process whereby mixed methyl esters of cottonseed oil fatty acids are obtained from soapstock ('foots') directly. The process has been taken up by VegeFat Inc., Dupon, Illinois, and developed further.

Using corn oil- and soya bean oil-foots as raw material as well as cottonseed oil soapstock, VegeFat now make 15 million lb. a year of methyl ester products for sale as high energy additives for livestock feeds.

In the process, acidulated soapstock together with methyl alcohol and catalyst is fed continuously through a heated packed column, remaining in the reactor at 120°C and 150 p.s.i. for about 10 minutes. Products from the reactor discharge continuously into an evaporator, where excess methyl alcohol and water, formed during esterification, are removed. The final product, virtually free of methyl alcohol and water, leaves the evaporator, whence it is distilled to obtain purified methyl esters, or used direct as feed additives or can be recycled through the reactor with fresh methanol to increase the methyl ester yield still further.

Attractiveness of the process is stated to lie in the catalyst and operating pressure. The catalyst is a crude form of

Twitchell's reagent made from naphthalene, distilled fatty acids and sulphuric acid. Cost of the catalyst is 6 to 7 cents a lb. VegeFat use a similar catalyst but actual composition is secret. When the mixture is dehydrated, the catalyst is precipitated and can be removed by filtering or centrifuging. A 5:1 mol ratio of methyl alcohol to total fatty acids in acidulated foots, 83% of the fatty acids are converted in one 10-minute pass. Recycling raises the conversion to 90%. This compares with a time of over one hour and 15:1 mol ratio of methyl alcohol to total fatty acids to obtain about 80% conversion. Even better is the use of hydrolysed foots. A 5:1 mol ratio of methyl alcohol to fatty acids in hydrolysed foots passing through the pressurised reactor is stated to give a 91.4% conversion, with recycling giving a 97% conversion. Other advantages quoted by VegeFat are: Use of ordinary steel pipe, as there is no corrosion problem even at 120°C; hold-up of methanol is low; catalyst permits use of inexpensive equipment; process is only semi-continuous.

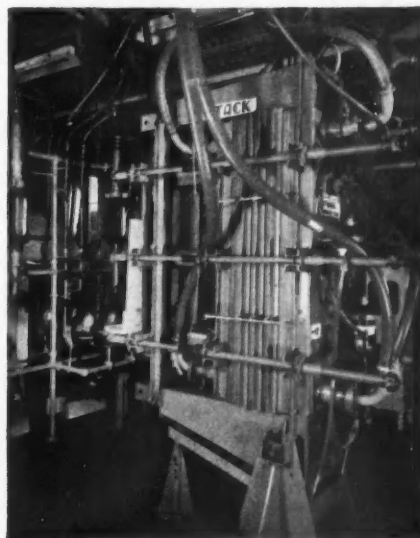
Unsaturated methyl esters are stated by VegeFat to be nutritionally better than other by-product fats as a feed additive. Selling price is 8 cents per lb. f.o.b. as against 9½ to 12 cents per lb. for crude vegetable oils and 7 cents per lb. for animal fats.

# DESALTING BRACKISH WATER

The first Electrodialysis plant for the reduction of the salt content of brackish water to be supplied from Europe on a commercial basis has been installed and is now operating

## at TOBRUK

This plant, designed and installed by William Boby & Co. Ltd. for The Libyan Public Development & Stabilisation Agency reduces the salt content of the water from 5,000 ppm to a potable level of 500 ppm. It has been operating so successfully that our client has now ordered additional 'Boby' plant to increase the daily output to 100,000 gallons — sufficient drinking water for the entire population of Tobruk.



*The original plant undergoing trials at the laboratories of William Boby & Co. Ltd.*

**WILLIAM  
BOBY  
& CO. LTD**

**RICKMANSWORTH, HERTFORDSHIRE  
ENGLAND**

**Telephone: RICKMANSWORTH 4251\***

**WATER  
BOBY  
TREATMENT**

**Established in 1875**



## SPEVACK'S HEAVY WATER PROCESS USES WASTE HEAT

NOW available for inspection is Jerome Spevack's heavy water process patents (U.S. Patent 2,895,803). This patent has been the subject of legal argument for two years and of two Supreme Court decisions.

Simple in concept but complex in execution the process involves use and reuse of process heat to concentrate deuterium from water at a fraction of operating costs involved in other methods. Two towers in each stage are employed, one hot, the other cold, with water flowing down and hydrogen sulphide flowing up in each. Advantage of the  $H_2S$  system is that no catalyst is required, but water or hydrogen can be used.

Hydrogen sulphide picks up deuterium in the hot tower from the water by isotope exchange, and water in the cold tower picks up deuterium from the  $H_2S$ . Bubble cap trays or similar contacting means are used to contact water and gas. Enriched  $H_2S$  from the first hot tower passes to the hot tower of the next stage, where it becomes enriched further; the rest goes to the cold tower, where it is depleted in deuterium.

Water entering the first cold tower, containing its normal amount of deuterium, is enriched as it passes through the tower. Some then goes to the next stage cold tower for further enrichment, while the remainder passes through the hot tower, where it is depleted in deuterium and discharged as waste.

Three ways employed to minimise waste heat are: (1) some cold water and hot gas flow together from stage to

stage, but all hot water and cold gas is returned to the preceding stage; (2)  $H_2S$  for all the hot towers is heated and humidified by both direct contact and indirect contact heat exchange with enriched hot tower gases from all the stages; (3) make-up heat is used to strip  $H_2S$  from waste water so preventing  $H_2S$  waste disposal problems and giving better heat transfer, when the hot waste warms up cold tower water passing to the hot towers.

Savings from reuse of heat are noticeable since heaviest cost item is in the primary concentration of deuterium from its 0.015% level in water to 1% or more. (Spevack gives this as 95% of total cost.) Two large plants that the U.S. has had operating the Spevack process are the Dana, Indiana, and the Savannah River, South Carolina plants; each has a capacity of 400 to 500 tons a year. The Dana plant has not been in operation since 1957 and is now being converted for another use. The Savannah river plant is estimated to produce 175 tons of heavy water a year. The U.S. Atomic Energy Commission, using the Spevack process, concentrate deuterium to about 15%, and then increase this  $D_2O$  content to 90% by fractional water distillation. Final enrichment is by electrolysis.

Operating Conditions	
Temperature:	
Cold towers ... ..	30°C.
Hot towers ... ..	120°C.
Pressure ... ..	240 p.s.i.a.
Mol ratio ( $H_2S:H_2O$ ) ... ..	2
Number of stages ... ..	2-5
% $D_2O$ in feedwater ... ..	0.014
% $D_2O$ in product from final stage ... ..	1-5
% recovery of $D_2O$ in feedwater ... ..	15-18
Flow ratio from one stage to next ... ..	4

## Improved Techniques for Natural Rubbers

WITH demand for basic rubbers increased by 70% in the last decade, the Natural Rubber Development Board in its 'Annual Report for 1958', forecasts a "bright future" for natural rubber, provided that "vigilance and energy continue to be applied to its development".

The special attention given during the year to improving processing and manufacturing methods of certain natural rubber products is dealt with in the annual report for 1958 of Rubber Technical Developments Ltd., one of the natural rubber research organisations. In the case of graft polymer rubbers the need for a material which can be handled on a mixing plant without preconditioning has long been apparent. Trials indicate that this can best be achieved with rubber modified from fresh latex on the plantations.

It has been established that simpler techniques can be employed in the preparation of anti-crystallising rubber by reaction of dry rubber with thiol acids, but that the products obtained are some-

what inferior in anti-crystallising properties to those obtained from latex. New reactions developed at the British Rubber Producers Research Association are being examined on a large scale.

A programme of work covering rates of shear and temperatures has shown that increasing the rate of shear has little influence on the speed of depolymerisation of rubber at temperatures above 200°C. At lower temperatures, however, the report states, the effect is pronounced, particularly in the early stages of mastication. Somewhat higher physical properties are obtained with vulcanisates depolymerised at 120°C, but the long periods of mastication required at this temperature are not justified by the marginal improvements in physical characteristics.

Marginal improvements in the physical properties of vulcanisates from fluid rubber compounds have been achieved by modifying the depolymerisation procedure. Thin section vulcanisates with much improved properties can be obtained using liquid compounds from polymer-reinforced depolymerised rubber.

## World Chemical Exports Rose 1% Last Year

THE provisional index of production for June 1959 prepared by the Central Statistical Office shows a figure of 125 for the chemical and allied industries, 100 being the 1954 average. This figure compares with 129 in April 1959 and 115 in June 1958.

U.K. exports of chemicals in 1958 were valued at \$737 million (about £263 million), a drop of 2% on the 1957 figure, according to figures published in the Board of Trade Journal, 4 September 1959.

Figures for other countries, in millions of dollars, were: W. Germany 940, other O.E.E.C. countries 1,421, U.S. 1,365, Canada 230, Japan 138.

Exports of chemicals from the main manufacturing countries were 1 per cent higher in 1958 than in 1957. Exports from the U.S. and Canada were lower, but exports from Germany and other European countries were 4% higher. The U.K.'s exports were recovering in the second half of 1958.

U.K. exports of inorganic chemicals fell by 6% between 1957 and 1958 and most European exporters did badly in this group (which is liable to be affected by the slackening in industrial activity) although the United States' exports rose substantially. The fall in U.K. exports of perfumery, soap, etc., and especially of synthetic detergents, is mainly a result of the increasing local production of countries formerly supplied by the United Kingdom. The fall was shared by France, the second largest exporter, but not by the United States, the third main exporter.

In common with most other countries, the United Kingdom's exports of dyeing, tanning and colouring materials were lower in 1958 than in 1957.

## 'World's Largest' Plastics Vessels



What are believed to be the world's largest all-plastics vessels are shown leaving Cawley Plastics Ltd., Wey Lock Works, Weybridge, Surrey. They are destined for a new chemical manufacturing process in the home counties, details of which have not been released. They are made of Tufplas (not Tugplas as stated in 'C.A.', 29 August, p. 220)



# ZINC DUST WITH A DIFFERENCE

## FOR THE PAINT INDUSTRY

Combined small and uniform particle size gives these important qualities:

**Smoothness of Paint Film**

**Uniformity of Surface**

**Maximum Corrosion Resistance**

**Easy Dispersion**

This Zinc Dust with its minimum of 95% zinc is outstanding amongst any other commercial grade of Zinc Dust. *For further technical details send for our booklet.*

**DELAVILLE SUPERFINE ZINC DUST**



**CONSOLIDATED ZINC CORPORATION (SALES) LIMITED**  
**37 DOVER STREET • LONDON W.1**

● **Mr. D. C. M. Salt**, director of sales, has been appointed alternate to **Mr. J. W. Urban** on the board of Monsanto Chemicals Ltd. Mr. Salt, who joined Monsanto in 1935, has a wide experience and knowledge of the company's selling operations. He was appointed general manager of sales in 1956 and, prior to his recent appointment, was general manager of the Chemicals Division.

● **Mr. F. W. Stokes**, who has been appointed to the board of Powell Duffryn Carbon Products Ltd., 8 Great Tower Street, London E.C.3, joined the company in 1951 and was appointed works manager in 1954. Over the past two years he has been closely concerned with the development of the company's activities in machining graphite for nuclear energy.

● **Sir Henry Jones**, the new chairman of the Gas Council (People in the News, 5 September), is a member of a family that has held high positions in the gas industry for just on 125 years. He was educated at Harrow and Pembroke College, Cambridge, where he took an engineering degree. Before the war he was engaged in integrating gas companies into more economic units. He served in the Army and after demobili-



Sir Henry Jones



W. K. Hutchison

sation with the rank of brigadier rejoined the gas industry, becoming chairman of the East Midlands Gas Board when the industry was nationalised 10 years ago. He became deputy chairman of the Gas Council in 1952 and was knighted in 1956. The new deputy chairman, **Mr. W. K. Hutchison**, read chemistry at Oxford and joined the Gas Light and Coke Co. as a research chemist in 1926. During the war he was director of Compressed Gases.

● **Captain R. A. Villiers, C.B.E., R.N. (Ret'd)**, took up his duties as the new director of the Scientific Instrument Manufacturers' Association on 1 September. From 1957 until his retirement in 1959 he was the U.K. Naval Representative with the N.A.T.O. Military Agency for Standardisation and chairman of the Naval Board in London.

● **Mr. D. G. Hemmant**, managing director of Powell Duffryn Technical Services Ltd., is being released for a period of up to one year to act as director of the newly formed Mining Machinery Manufacturers' Export Association. During his absence **Mr. R. Turner**, chief engineer, will be acting managing director.

## PEOPLE in the news

● The British Welding Research Association has formed a Members' Service Department, combining the functions of the old Liaison and Publications Departments. Head of the new department is **Mr. P. H. R. Lane, B.Sc. (Eng.), A.I.M., A.M.Inst.W.**, until recently deputy chief metallurgist of the association. **Mr. R. G. Burt, O.B.E., B.Sc. (Eng.), M.I.Mech.E., M.Inst.W.**, hitherto chief development officer, remains with the association as development consultant.

● **Mr. G. W. P. Scott**, formerly senior technical sales engineer, has been appointed sales manager of the Audco Anzin Products Division of the Audley Engineering Co. Ltd., Newport, Salop. **Mr. K. H. Lloyd**, formerly senior technical engineer, has been appointed engineering manager. **Mr. Hans Bosshart** has been appointed the company's representative for the Benelux countries.

● **Mr. N. R. Kirkby**, who has just been appointed general sales manager of Croda Ltd., Snaith, Goole, Yorks,



N. R. Kirkby

will be making a tour of Croda's Continental associates next month. Mr. Kirkby, who joined Croda 20 years ago as a laboratory assistant, has for the past few years been the company's chief technical representative in the Sheffield area. His new post is to take charge of Croda's entire sales organisation. **Mr. R. J. Seddon** will succeed Mr. Kirkby as representative in the Sheffield area.

● **Mr. Albert Gale**, managing director of Diversey (U.K.) Ltd., and Deosan Ltd., leaves this week-end for a three weeks' trip to the U.S. Mr. Gale will be visiting the Diversey Corporation of Chicago, central point of the world-wide Diversey Group of companies.

● **Mr. P. J. C. Bovill**, managing director of Newton Chambers and Co. Ltd., Thorncliffe, Sheffield, has been elected the 324th Master Cutler. He joined Newton Chambers in 1922 as assistant manager of their subsidiary company, Thorncliffe Coal Distillation Ltd., and two years later was appointed assistant manager of the Izal department. In 1923 he became works and sales manager of the tar distillation works. In 1933 he was appointed joint manager of Coke Oven Products Ltd., in which Newton Chambers were then one of the partners, and from there, in 1939, he went to the Rother Vale Collieries branch of the United Steel Companies as commercial manager of the by-products department. He returned to Newton Chambers in February, 1942, as a local director and general manager of the Chemicals Branch (now Division). In 1954 he became assistant managing director in charge of the Chemicals Division. The following year he joined the board as a full director and in May, 1956, became managing director on the retirement of Sir Harold West.

● **Mr. G. J. McAlpine**, who has been appointed as sales manager of Benger Laboratories Ltd., Holmes Chapel, Ches., joined the company in 1956 as a medical representative.

● **Mr. K. Fearnside** has been appointed to the board of Smiths Aircraft Instruments Ltd., Kelvin House, Wembley, Middx., as director of research.

## Obituary

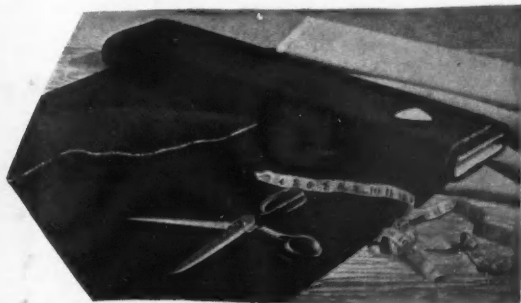
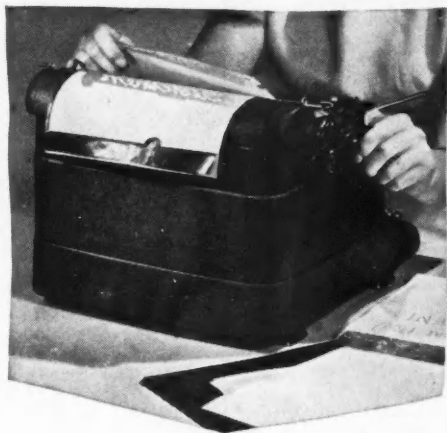
**Sir Alfred Egerton, F.R.S.**, Professor of Chemical Engineering at the Imperial College of Science from 1936 to 1952 and director of the Salters' Institute of Industrial Chemistry until this year, died in France on Monday, 7 September, aged 72. He was educated at Eton and University College, London, where he graduated in chemistry in 1908, and subsequently studied in Paris and Berlin. He was appointed reader in thermo-dynamics at Oxford in 1923 and Professor of Chemical Engineering at Imperial College in 1936. He was elected Fellow of the Royal Society in 1926 and was one of the secretaries of the Society from 1938 to 1948. Sir Alfred established a School of Combustion Research, first at Oxford and then at London, which achieved international fame. In 1946 he was awarded the Rumford Medal of the Royal Society.

● **Mr. E. D. Campbell**, area director, since last March, of the Scottish and Northern Ireland branches of British Oil and Cake Mills, Ltd., after collapsing in his office on 1 September.

## Will

● **Mr. Sidney Daniel Chaloner**, managing director of Chemical Extractions Ltd., who died on 21 January, left £5,554 net.

● **Dr. Frederick Tattersfield, O.B.E., D.Sc., F.R.I.C.**, formerly head of the Department of Insecticides and Fungicides at Rothamsted Experimental Station, who died on 1 May, aged 78, left £51,005 15s 8d net.



# PRICE'S FATTY ALCOHOLS

*A length of cloth, a duplicating stencil, a lubricating oil and a lipstick don't, at first sight, seem to have any connection. And yet they all owe something to Price's Fatty Alcohols. Price's have developed a diverse and varied range of C16/C18 Fatty Alcohols to meet many specific needs. If you think you have a use for Fatty Alcohols please let us advise you.*



**PRICE'S (BROMBOROUGH) LIMITED**

Bromborough Pool · New Ferry · Nr. Birkenhead · Tel: Rock Ferry 2020

OLEINES · STEARINES · FATTY ACIDS · FATTY ALCOHOLS · TEXTILE OILS

## Commercial News

### Burt, Boulton and Haywood

Tar distillers, manufacturers of chemicals and horticultural products, Burt, Boulton and Haywood Ltd., report an increase in net profit of the parent company. The dividend is increased with a final of 8% to give a total of 12%, less tax, for the year ended 31 March last.

Production of phthalic anhydride began at the end of September last at the new plant installed by Societe Chimique de Selzaete. Technical results are stated by Mr. Howard Hitchcock to have exceeded expectations. The whole of the plant's output has been sold and the future prospect is described as "quite encouraging." The plant added at Selzaete is to operate "for the benefit of the Belgian Co-operative Tar Scheme." The major part of the profit goes to the producers of crude tar and only a minor part is attributable to the tar distilling company concerned. Benefits accruing to Burt, Boulton and Haywood are dependent, after certain capital responsibilities, on their share in the capital in the Tar Distilling Co.

In the U.K., the company's subsidiary, Alchemy Ltd., has increased its profits and it is now intended to expand the manufacturing activities of this company. "One major project is now being studied in detail."

### Fertilizers and Chemicals Co.

Issue of £5 million of debentures by the Fertilizers and Chemicals Co., of Israel, was brought on the market in August and oversubscribed the same day. The issue, which marks a turning point in the firm's finances, will make

the company independent of the development budget unless it is called upon to undertake a sudden large-scale expansion of basic chemical production installations. The issue will be used to complete the expansion of the ammonia plant, the balance being used for the conversion of short-term loans into long-term debts. The Government will also convert a £7 million loan to the firm into shares. The paid-up capital will then total £25 million, or 40% of the investment capital.

Commercial manager of the company, A. Reisner, stated that the plant has already satisfied all local demands for fertilisers. Exports now stand at \$1,300,000, or about 15% of production, and should reach \$2 million within two years.

Arrangements are being made with a Brazilian company, Nitro Quimica Brasileira, Rio de Janeiro, for technical assistance in establishing plants for the exploitation of phosphates. Fertilizers and Chemicals are also negotiating with a number of other countries to provide technical know-how, and with European banks for a £5 million foreign currency debenture issue.

### Williams (Hounslow)

Williams (Hounslow) Ltd. and the Sun Chemical Corporation of New York City have formed a joint company to be known as Williams Ansbacher. It will provide a link between two of the oldest manufacturers of dyestuffs, fine colours and chemicals.

### NEW COMPANIES

H. NICHOLLS AND CO. (CHEMICALS) LTD. Cap. £2,000. Merchants of and dealers in industrial chemicals and coal tar products, etc. Directors: H., L., S., and B. Nicholls. Reg. office: 71 Barton Road, Worsley, nr. Manchester.

## Market Reports

### BUYING INTEREST COVERS WIDE RANGE

**LONDON** Demand has been well maintained in most sections of the industrial chemicals market during the past week and buying interest has covered a fairly wide range. With the exception of the fluctuation in the chemical compounds of zinc, prices show no outstanding change and the tone continues firm. The current price of zinc oxide, red seal, is £101 a ton.

Trade in fertilisers is seasonably quiet, but some buying interest has been reported for the compounds.

Among the coal tar products cresylic acid and creosote oil continue in active request on home and export account, and the demand for road tar and pitch is sustained.

**MANCHESTER** The movement of general chemical products to consumers in the Lancashire and West Riding areas during the past week has been on a fairly steady scale and a further increase in the demand is looked for now

that the holiday interruptions to industrial operations are in sight of ending. In the case of the textile industries, however, there is obviously room for improvement in takings in some sections. Quotations are well maintained, with little sign of easiness in any direction. Buying interest in fertilisers is still no more than moderate.

**SCOTLAND** Trading conditions during the past week in the Scottish heavy chemical market continued fairly active. Demands for the usual range of basic chemicals have been much in evidence. Although the majority have been against current requirements there has been quite an interest shown in forward deliveries.

Except for some slight variations most prices have remained firm.

There has been quite a volume of enquiries received for the overseas market and conditions remain reasonably steady.

## TRADE NOTES

### Savings Passed On

Production-line methods for the manufacture of Holmes-Connersville positive air blowers introduced by W. C. Holmes and Co. Ltd., Turnbridge, Huddersfield, have led to savings which are being handed on to customers in the form of lower prices. As an example, the price of a size 44 type AFS blower has been reduced by about 19%.

Where blowers are incorporated in plant for resale a discount of 5% will be given and there will be a similar discount for large orders.

### Change of Address

Universal Laboratories Ltd., whose products include Daxaids, Dascote, Lieve and Cleer, will be moving their head office to their plant at Wear Bay Road, Folkestone, Kent, on 14 September. The telephone number will be changed to Folkestone 51981.

### Potassium Permanganate Prices

Sole U.K. manufacturers of potassium permanganate, Boots Pure Drug Co. Ltd., Nottingham, state that general cost increases have necessitated a small increase in prices for B.P. and technical grade potassium permanganate. There has been no change in price for this chemical since August 1957. The new prices, which come into effect from 12 September are: B.P. grade, price increased by ½d/lb. (5 cwt. lots, 1s 10½d); and Technical Grade price increased by 4s 6d/cwt. (198s/cwt. in ton lots).

### Nylaflo Pressure Hose and Tubing

A new brochure published by Polypenco Ltd., 68-70 Tewin Road, Welwyn Garden City, describes the various properties, uses and advantages of their Nylaflo pressure hose and tubing. It is available from the company free of charge.

### Moulding Materials Data Book

A new data book describing their range of thermosetting and thermoplastic moulding materials has recently been published by British Resin Products Ltd., Devonshire House, Piccadilly, London W.1.

The data book provides basic technical information in tabular form and is divided into five sections, each dealing with a separate group of materials as follows: Rockite phenolic moulding materials, Styron polystyrene moulding materials, 'Rigidex' rigid polyethylene, Rockite polyester dough moulding compounds, Tyril styrene acrylonitrile copolymer.

### New Bradford I.C.I. Office

Imperial Chemical Industries Ltd. have moved their Bradford area office into a new five-storey block of offices in Thornton House, Bridge Street, Bradford. This office controls the company's largest sales area in the North of England, the whole of the East and West Ridings, Lincolnshire down to Skegness and fringes of Nottinghamshire and Derbyshire.





# RECOVERY PROCESS

is our business

*Consult us for—*

**SOLVENT RECOVERY** We undertake complete installations for the recovery of volatile solvents otherwise lost to atmosphere from industrial processes. Virtually complete recovery is effected by activated carbon adsorption or by liquid washing with subsequent distillation where necessary.

**DUST COLLECTION** Of primary importance to most industries today both from health considerations and industrial efficiency. The CECAFILTER incorporates a special continuous cleaning action using a labyrinth of fibres which are kept clean by reverse jet air ensuring the arresting of superfine particles and the highly efficient collection of powdered products.

**ELECTROSTATIC PRECIPITATION** Complete installation for the electrostatic precipitation of dusts, smokes and mists from air and industrial gases.

**CARBON DI-OXIDE RECOVERY** Complete installation for the drying and purification of gases yielding CO<sub>2</sub>. Plant includes liquefaction, bottling and dry ice manufacture.

**AIR & GAS DRYING** A necessity for many industrial plants today. We can effect a 100% de-humidification of gases and air using any solid desiccant medium together with refrigeration where necessary.

**ADSORPTION SYSTEMS** Complete adsorption plant for purification and treatment of air and gas streams and removal of poisonous, noxious or organic vapours.

**P.V. 120 VALVE** Light construction, low cost, minimum maintenance. When closed is 100% gas tight, replaces with economy conventional heavy type valves for low pressure work—differential pressures up to 5-lb. per sq. inch will handle gases up to 300°F. Made in these diameters 12", 16", 20", 24", 30" and 42". Enquiries for larger sizes invited.



**THE BRITISH CECA COMPANY LTD.**

INDUSTRIAL PLANT DIVISION

175, PICCADILLY, LONDON, W.1.

Telephone: HYDE PARK 5131

Telegrams: ACTICARBON, PICCY, LONDON

Cables: ACTICARBON LONDON

# NEW PATENTS

By permission of the Controller, HM Stationery Office, the following extracts are reproduced from the 'Official Journal (Patents)', which is available from the Patent Office (Sales Branch), 25 Southampton Buildings, Chancery Lane, London W.C.2, price 3s 6d including postage; annual subscription £8 2s.

Specifications filed in connection with the acceptances in the following list will be open to public inspection on the dates shown. Opposition to the grant of a patent on any of the applications listed may be lodged by filing patents form 12 at any time within the prescribed period.

## ACCEPTANCES

### Open to public inspection 28 October

Fire-fighting foams. Alginate Industries Ltd. [Cognate applications 1617 and 8730.] 822 545  
Cellular elastomeric materials. Dunlop Rubber Co. Ltd. 822 546  
Alkyd/isocyanate solutions. Imperial Chemical Industries Ltd. 822 547  
Drying process and apparatus. Imperial Chemical Industries Ltd. 822 704  
Modifying the properties of fibres and foils of aromatic polyesters. Farbwerke Hoechst A.G. 822 483  
Chlorite bleaching processes. Farbwerke Hoechst A.G. 822 603  
Separating paraffins from hydrocarbon oils. Edleau G.m.b.H. 822 549  
Gas filters. Cambridge Filter Corp. 822 464  
Production of fluorescent coating compositions. Industrial Colours Ltd. 822 709  
Production of organo-aluminium compounds. Bergwerksgesellschaft Hibernia A.G. 822 484  
Metal cleaning compositions. Ajem Laboratories Inc. 822 606  
Separating methanol and methyl acetate from one another. Wacker-Chemie G.m.b.H. 822 607  
Chemical nickel plating. General American Transportation Corp. 821 407 & 822 498  
Addition products of alkyl linoleates and alkyl fumarates and vinyl chloride polymers plasticized therewith. Monsanto Chemical Co. 822 608  
Manufacture of 2-chloro-meta-xylene. Farbwerke Hoechst AG. 822 717  
Producing metal alloys of low impurity content. Pittsburgh Metallurgical Co. Inc. 822 492  
Production of xanthene derivatives. Ward Blenkinsop & Co. Ltd. 822 720  
Apparatus for melting synthetic organic linear high polymers for use in the production of filaments and films by extrusion of the melt. Farbenfabriken Bayer A.G. 822 722  
Quaternary ammonium compounds related to reserpine and process for their manufacture. Ciba Ltd. 822 723  
Polymerisation of olefins. Gelsberg Benzol A.G. 822 611  
Organochloro-lanes. General Electric Co. 822 561  
Separating pure crystalline maleic anhydride directly from mixtures of gases and steam. Montecatini. 822 612  
Bonding rubber to metal composition therefor, and bonded rubber-metal products. Lord Manufacturing Co. 822 725  
Separation of hydrofluoric and hydrochloric acid gases. Soc. D'Electro-Chimie D'Electrometallurgie et des Acieries Electriques D'Ugine. 822 494  
Vitamin products and process of preparing same. Pfizer & Co. Inc., C. 822 728  
Fat compositions and preparation thereof. General Foods Corp. 822 614  
Polyethylene films. Imperial Chemical Industries Ltd. 822 496  
Converting gaseous or liquid hydrocarbons into gases consisting substantially of low-molecular weight carbon compounds and hydrogen. Gerhold, M. 822 615  
Production of polyurethane plastics. Farbenfabriken Bayer A.G. 822 499  
Colouration process for artificial fibres. Imperial Chemical Industries Ltd. 822 500  
Preparing mixed tri-ether/ether compositions. Eastman Kodak Co. [Addition to 791 165.] 822 730  
Production of acrylic acid and derivatives thereof. Badische Anilin & Soda-Fabrik A.G. 822 731

Production of ozone. British Oxygen Co. Ltd. 822 502  
Indigoid dyestuffs and process for their manufacture. Ciba Ltd. 822 732  
Powder blower. Cooper, McDougall & Robertson Ltd. 822 733  
Synthesis of deuterated and tritiated organic compounds. National Research Council. 822 617  
Metalisable monoazo dyestuffs, complex heavy metal compounds thereof, and their use. Geigy A.G., J. R. 822 734  
Chlorination of wool to reduce felting and creasing. Geigy A.G., J. R. 822 735  
Indoles and process for their manufacture. Ciba Ltd. 822 736  
Alkyl-aminoalkyl-phenothiazines and pharmaceutical preparations containing them. Ciba Ltd. 822 618  
Polymerisation of olefins. Petrochemicals Ltd. 822 737  
Manufacture of reaction products of polyisocyanates with alkylene oxide addition products. Ciba Ltd. 822 504  
Lubricating oil additives. Chemon Corp. 822 620  
Production of hard and flexible microcrystalline waxes. British Petroleum Co. Ltd and Collier, A. [Cognate application 38833.] 822 740  
Vulcanisable compositions. Imperial Chemical Industries Ltd. 822 621  
Extracting products of therapeutic value from the pancreas. Alt, I. 822 741  
Production of sponges from polyurethanes. Koepp & Co. Chemische Fabrik A.G., R. 822 446  
Polymerisation process. Distillers Co. Ltd. 822 742  
Moulding polytetrafluoroethylene. Montecatini. 822 744  
Preparation of  $\delta$ -5-olefinic ketones and dienones. Etablissements Roure-Bertrand Fils & Justin Dupont. 822 572  
Dehydrating starch conversion liquors by evaporation. Corn Products Co. 822 748  
Purification of sewage and industrial effluents. Filtration Consultants Ltd. 822 749  
Method of carrying out catalytic reactions. Distillers Co. Ltd. 822 630  
Titanium base alloy sheet materials. National Research Development Corp. 822 750  
Polymerisation process. Monsanto Chemicals Ltd. 822 751  
Lubricating oil compositions. Esso Research & Engineering Co. 822 632  
2:3:4:5-Tetrahydrobenzazepinium salts. Imperial Chemical Industries Ltd. 822 506  
Process of rendering phosphate rock assimilable by plant life. Larson, J. D. 822 637  
Curing polyepoxides and resulting products. Bataafsche Petroleum Maatschappij N.V., DE. 822 638  
Producing amides of pyridine carboxylic acids. Aries Associates Inc. 822 579  
Anticorrosive coating compositions for metals. Hunter & Co. (Paints) Ltd., and Rodwell, R. H. 822 449  
Organopolysiloxane compositions. General Electric Co. 822 649  
Melt spinning polypropylene. Imperial Chemical Industries Ltd. 822 450  
Production of magnesium base alloys. Magnesium Elektron Ltd. 822 541  
Manufacture of 1-methyl-6-nitro-4-quinolone 3-carboxylic acid. Imperial Chemical Industries Ltd. 822 506  
Granular fertilizers. Scottish Agricultural Industries Ltd. 822 653  
Making oil-soluble sulphonates of improved quality. Continental Oil Co. 822 654  
Lubricant additives. Wakefield & Co. Ltd., C. C. [Cognate application 23809.] 822 655  
Extruding polytetrafluoroethylene. Resistoflex Corp. 822 515  
Preparing a nitro furan compound. Hellinghuizer B. 822 760  
N-Substituted-4-phenyl-4-carboxylic piperidines and the preparation thereof. British Drug Houses Ltd. 822 517  
Esters of iso-sebacic acid. Distillers Co. Ltd. 822 518  
Preparation of solutions of amylose, and the production of films, sheets, fibres and the like therefrom and articles thereof. Coöperatieve Verkoop en Productievereniging van Aardappelmeele en Derivaten GA. 822 587  
Manufacture of isopropenyl acetate. Wacker-Chemie G.m.b.H. 822 657  
Bis-(aminomethyl)-benzene derivatives. Sterling Drug Inc. 822 589  
Trimethylhydroxyphenylchroman derivatives and

their preparation. Bataafsche Petroleum Maatschappij N.V., DE. 822 659  
Carbazole derivatives and process for the production thereof. Chemische Fabrik Promonta G.m.b.H. 822 592  
Production of nitriles or dinitriles. Lonza Electric & Chemical Works Ltd. 822 531  
Method for gas analysis. Union Carbide Corp. 822 666  
Preparation of common salt by the evaporation of solutions. Koninklijke Nederlandsche Zoutindustrie N.V. 822 467  
Catalytic process for making stable acrolein-pentaerythritol condensates. Union Carbide Corp. 822 468  
Isomerisation of alkanes and catalysts therefor. Engelhard Industries Inc. 822 670  
Treatment of polyoxymethylene film. Du Pont de Nemours & Co. E. I. 822 672  
Silicone compositions for imparting water-repellancy. Monsanto Chemicals Ltd. 822 673  
Curing polyurethane elastomers. U.S. Rubber Co. 822 632  
Derivatives of phosphoric acid triamide and thiophosphoric acid triamide, and the production thereof. Asta-Werke A.G. 822 775  
Halopheno-thiazine derivatives. Searle & Co. G.D. 822 777  
Methods of and apparatus for separating liquid-gas mixtures. Inventa A.G. 822 675  
Process for properties of adducts formed from urea and straight-chain paraffin hydrocarbons or from thiourea and branched-chain paraffin hydrocarbons and naphthenes. Edleau G.m.b.H. 822 780  
Preparation of 2, 6-diethylpiperazine. Wyandotte Chemicals Corp. [Addition to 791 744.] 822 496  
Process for making cellular polyethylene articles. Dow Chemical Co. 822 425  
Tetracycline antibiotic compositions. American Cyanamid Co. 822 422  
Preparation of quinolines. Union Carbide Corp. 822 457  
Chemical sealing and solidifying means. Deutsche Endol A.G. 822 683  
Alkylation of isobutane. Universal Oil Products Co. 822 779  
Process for separately recovering an aldehyde or ketone and an aqueous solution of the corresponding alcohol from an aqueous mixture containing the aldehyde or ketone and the alcohol. Usines de Melle. 822 435  
Hydrodesulphurisation of petroleum fractions. Esso Research & Engineering Co. and Standard Vacuum Oil Co. 822 682  
Recovering uranium from solution. Potasse & Enersiv Chimiques. 822 131  
Identifying constituents of liquid mixtures. Benzole Producers Ltd. 822 432  
Production of chromium by low-pressure reduction of oxides. Weil, W. M. 822 437  
Thionophosphoric acid esters and a process for their production. Farbenfabriken Bayer A.G. 822 476

## DIARY DATES

**SUNDAY 13 SEPTEMBER**  
American Chem. Soc.—Atlantic City, N.J. 136th meeting (till 18 September).

**TUESDAY 15 SEPTEMBER**  
Inst. of Metal Finishing—Bristol: Royal Hotel, 7 p.m. 'The influence of chromium on the corrosion resistance of nickel chromium deposits', by Mr. H. Silman.

**WEDNESDAY 16 SEPTEMBER**  
Soc. for Water Treatment—Edinburgh: Grosvenor Hotel, 5.45 p.m. Autumn meeting begins (three days).

**THURSDAY 17 SEPTEMBER**  
S.A.C.—Birmingham: University, 6.30 p.m. Discussion on 'Some applications of E.D.T.A.' to be opened by Mr. C. A. Johnson, Mr. J. Blenkins and Dr. T. S. West.

Soc. Instr. Tech.—Derby: Coll. of Technology, Normanton Road, 7.15 p.m. 'Making and using germanium power rectifiers', by Dr. P. M. Tipple.

Soc. Instr. Tech.—Grangemouth: Ellwyn Restaurant, Newlands Road, 7 p.m. 'The physical determination of microgramme quantities of dissolved oxygen in boiled feed water', by Dr. H. W. Hely.

**FRIDAY 18 SEPTEMBER**  
Soc. Instr. Tech.—Glasgow: Building Centre, Sauchiehall Street, 7.15 p.m. 'Physical determination of microgramme quantities of dissolved oxygen in boiled feed water', by Dr. H. W. Hely.

# Classified Advertisements

**CLASSIFIED RATES:** All sections 5d. per word. Minimum 8/-. Three or more insertions 4d. per word. Box Number 2/- extra. Up to 10 a.m. Tuesday for insertion same week.  
**SEMI-DISPLAY:** 30/- per inch. Three or more insertions 25/- per inch.  
**SUBSCRIPTION:** Annual Subscription of 52/6 brings 52 weekly copies of **CHEMICAL AGE** direct to your address from the printer (postage paid by the publishers), and a copy of **CHEMICAL AGE DIRECTORY AND WHO'S WHO**.  
**COMPANY MEETINGS AND REPORTS:** £12.12.0 per column. Three column measure (approximately 360 words).

## INQUIRIES INVITED

West Riding Company with warehouse accommodation, transport, office and other facilities, seeks agencies. Chemicals, Fertilizers, etc., preferred, but any proposition given careful consideration. Box No. 3665.

## PATENTS

The Proprietors of Patent No. 691908 for "POLYMERIZATION PROCESS" desire to secure commercial exploitation by Licence or otherwise in the United Kingdom. Replies to **Haseltine Lake & Co.**, 28, Southampton Buildings, Chancery Lane, London, W.C.2.

## PLANT AND MACHINERY FOR SALE

**AUTOCLAVE**, Steam Jacketted 150 lb., 6 ft. 0 in. by 3 ft. 3 in. diameter, quick closing door, **VACUUM OVEN** 7 ft. 3 in. by 5 ft. 3 in., eleven steam heated shelves 7 ft. by 3 ft. 8 in., with condensor and vacuum pump.

**THOMPSON & SON (MILLWALL) LTD.**  
**CUBA STREET, LONDON, E.14.**  
 East 1844.

Bonecourt Waste Heat Steam Boiler, 3,500 lbs. evap., 120 lbs. pressure. Davey Paxman Self-contained Economic Steam Boiler, 4/5,000 lbs. evap., 100 lbs. pressure. Quantity Flanged Steel Tubes 12 in., 14 in. and 15 in. dia. **A. H. Kimmins & Sons Ltd.**, Lyndhurst Road, Worthing.

Brand New **COCHRAN** Vertical and **ECONOMIC** Self-contained **STEAM BOILERS** in stock, also all sizes reconditioned and guaranteed. List on request.

**STAINLESS STEEL TANKS, PANS, CONDENSERS, PLATES, VALVES AND COCKS.** Very wide selection. 80 gall. S.S. Jacketed Mining Pan, tilting type.

Ten new enamel-lined **ENCLOSED TANKS**, 150/1,000 galls.

**FRED WATKINS (ENGINEERING) LTD.,**  
**COLEFORD, GLOS.**  
 Phone: Coleford 2271/2.

## PLANT AND MACHINERY FOR SALE: *continued*

**CHARCOAL, ANIMAL AND VEGETABLE**, Horticultural burning, filtering, disinfecting, medicinal. Also lumps, ground and granulated. **THOMAS HILL-JONES, INVICTA WORKS, BOW COMMON LANE, LONDON, E.3 (TELEPHONE: EAST 3285).**

## FOR SALE

### COMPLETE MODERN HIGH CLASS CRUSHING & SCREENING PLANT.

Comprising:—

"**NEWELL**" 5 ft. 0 in. by 5 ft. 0 in. **BALL MILL**, continuous type scoop and scroll feed, trunnion discharge, drive through friction clutch by 75 h.p. T.E.S.C. Slip Ring Motor, 400 volt, 3 phase, 50 cycles. All new 1957. Complete with new spare set of manganese steel lining plates and change of balls.

Two—"STURTEVANT" size 32 in. by 16 in. Heavy Duty Crushing Rolls, manganese steel shells on tapered hearts, dust proof bearings. Each driven by two 20 h.p. T.E.S.C. Motors with Opperman Gear Reducers through vee ropes. New 1957. Complete spare set of rolls and bearings available.

Three—"NIAGARA" type E7B Vibrating Screens, size 40 in. by 160 in. with 10 h.p. T.E.S.C. Motors. New 1957 and "as new".

One—"NIAGARA", type E7A size 40 in. by 120 in. with 7½ h.p. T.E.S.C. Motor. New 1957 and "as new".

Two—"NIAGARA", type E5B size 30 in. by 100 in. with 5 h.p. T.E.S.C. Motors. New 1957 and "as new".

One—"LOCKER" 55 **ROTEX** Vibrating Screen, 5 deck, with 10 h.p. T.E.S.C. Motor. New 1957 and "as new".

Three—"PEGSON" **"LIVEWIRE"** 2 deck Vibrating Screens, size 8 ft. by 3 ft. with 1 h.p. T.E.S.C. Motors. As new.

Five—Totally Enclosed Vertical Belt & Bucket Elevators, 8 in. buckets, 24 ft., 30 ft. and 36 ft. centres with 2 h.p. Geared Motor drives. As new.

Four—Troughed Belt Conveyors, 16 in. belts, steel pan construction, 18 in. head & tail drums, 2 h.p. Geared Motor drives. Up to 135 ft. long. As new.

One—"ROTARY DRYER", 15 ft. by 2 ft. 6 in. dia., oil fired. With driving motor.

Also Steel Hoppers, Steel Flooring, Electric Feeders, etc., etc.

All for sale at bargain prices to clear from site near Birmingham. For full details apply:—

**G. E. SIMM (MACHINERY) LIMITED,**  
 27 Broomgrove Road, Sheffield, 10.

## PLANT AND MACHINERY FOR SALE: continued

MORTON, SON AND WARD LIMITED  
offer

## STAINLESS STEEL VESSELS

One TANK 10 ft. by 2 ft. 6 in. dia. totally enclosed, suitable for 20 lb. p.s.i. w.p.  
 One CRYSTALLIZING PAN 4 ft. dia. by 1 ft. 6 in. deep, detachable lid, with or without jacket.  
 Several s.s. COILS from 2 ft. to 7 ft. dia.  
 Assortment of s.s. VALVES, PLUG COCKS, etc., from  $\frac{1}{4}$  in. to 3 in.  
 Quantity of s.s. TUBING and s.s. FLANGES.  
 All above second-hand and in good condition.

NEW UNITS in stainless or mild steel made to requirements.  
 CONDENSERS,  
 MIXING VESSELS, JACKETED PANS with or without mixing gear.  
 'MORWARD' 'U'-shaped TROUGH MIXERS with or without jackets.  
 TANKS, CYLINDERS, RECEIVERS, PRESSURE VESSELS and AUTOCLAVES.  
 Stirring gear can be fitted to any vessels.  
 New PORTABLE STIRRING UNITS with clamp-on attachment to requirements.

New MONO pumps and other second-hand PUMPS in stock.  
 Enquiries invited.

MORTON, SON AND WARD LIMITED,  
 DOBCROSS, OLDHAM,  
 Lancs.  
 Phone Saddleworth 437

## PHONE 98 STAINES

S.S. 1,500 gall. Cyl. Tank, 9 ft. by 6 ft. diam.  
 S.S. Unused Jac. Pans, 20 in. by 17 in. — 45 w.p.  
 S.S. Unused Gas-heated Jac. Pans, 26 in. by 21 in. and 30 in. by 24 in.  
 S.S. Clad Tanks, 750 gal., 7 ft. by 3 ft. 3 in. (8).  
 S.S. Pans or Tanks — 20 in. by 28 in. deep (18).  
 S.S. Mixing Vats, 280 gal. each A.C. (2).  
 S.S. Tanks, 4 ft. diam., by 3 ft. deep, 200 galls. (3).  
 S.S. Unused Elec. Heated Tanks, 4 ft. by 3 ft. 6 in. by 10 in. deep. 70 gall. capacity. A.C. (10 available).  
 S.S. Homogenizer 3 plunger type, 2 h.p. A.C.  
 S.S. Plunger Pumps, 4 in. by 6 in. stroke, A.C. (2).  
 S.S. Unused Cyl. Mixers, 90 and 300 gallons.  
 'Z', Fin Blade, 'U' Trough and Cyl. Mixers all types and sizes in stock.

Pumps, Receivers, Hydros, Condensers, etc.

Send for lists.

HARRY H. GARDAM & CO. LTD.,  
 100 CHURCH STREET, STAINES

STAINLESS STEEL DOUBLE CONE MIXER, 2 ft. by 3 ft.  
 MOTRON 20 gall. Double 'Z' Mixer. Lying Willow Tree Works, Swallowfield, Berkshire. Apply: Winkworth Machinery Ltd., 65 High Street, Staines. Telephone 1010.

## SCIENTIFIC SERVICES

SILICA CONES AND SOCKETS, SILICA TUBING,  
 POLISHED SILICA DISCS AND GLAZED SHEET ex-stock from: Jencons (Scientific) Ltd., Mark Road, Hemel Hempstead, Hertfordshire. Boxmoor 4641.

## SITUATIONS VACANT

**CHEMICAL INSPECTOR: DEPARTMENT OF HEALTH FOR SCOTLAND.** Pensionable post in Edinburgh for man at least 35 on 1.7.59 with university degree in Science or Technology, or an acceptable equivalent. Experience (not less than 10 years) and knowledge of chemical or fuel technology, engineering, and related industries essential. Preference given to those who have achieved corporate membership of R.I.C. or Institution of Chemical Engineers. Duties include administration of Alkali Works Regulation Acts, 1906 and 1951 to control emission of noxious gases, and to advise on such matters as the treatment of trade wastes, and safe disposal of radioactive wastes. Travelling involved. Starting Salary (Edinburgh) £1,595 (at 35) up to £1,790 at 38 or over. Scale £2,070. Write to Establishment Officer, Department of Health for Scotland, Room 30, St. Andrew's House, Edinburgh, 1, for application form. Closing date 30th September, 1959.

**TECHNICAL OFFICER** required for Fertiliser Works near Chester. Essential requirements are University Degree in Chemistry together with some years experience of control laboratory and technical development work in the fertiliser field. Post offers good salary and opportunity for advancement, with excellent conditions of employment, Superannuation Fund etc. Apply Secretary, Edward Webb & Sons (Stourbridge) Ltd., Wordsley, Stourbridge, Worcs.

## WORK WANTED AND OFFERED

CRUSHING, GRINDING, MIXING and DRYING for the trade.  
 THE CRACK PULVERISING MILLS LTD.

Plantation House,  
 Mincing Lane,  
 London, E.C.2.

Classified Advertisements can be accepted for  
 insertion up to 10 a.m. Tuesday for insertion  
 in the same week.

## THE WORLD'S GREATEST BOOKSHOP

**FOYLES**  
 FOR BOOKS

## Technical Books

119-125 CHARING CROSS ROAD, LONDON, W.C.2

Gerrard 5660 (20 lines) \* Open 9-6 (inc. Sat.)  
 Nearest Station: Tottenham Court Road

## GLASSBLOWING



Prompt delivery our speciality  
 OFFICIAL DISTRIBUTORS OF QUICKFIT  
 and QUARTZ GLASSWARE  
 We welcome your enquiries  
 Micro and Semi Micro  
 apparatus available from stock

**T. W. MCCARTHY  
 & SON, LTD**

Complete Laboratory Furnishers

30a Clifton Street, Cardiff

Telephone: Cardiff 26251



## Chemical Age Enquiry Service

For fuller details of equipment, apparatus, chemicals etc., in the advertisement or editorial pages of Chemical Age, fill in the coupons below, ONE PER ENQUIRY, and return to us.

*Please send further details about.....*

*mentioned on page.....of this issue.*

*Name..... Position.....*

*Firm.....*

*Address .....*

**Chemical Age Enquiry Service.**

*Please send further details about.....*

*mentioned on page.....of this issue.*

*Name..... Position.....*

*Firm.....*

*Address .....*

**Chemical Age Enquiry Service.**

*Please send further details about.....*

*mentioned on page.....of this issue.*

*Name..... Position.....*

*Firm.....*

*Address .....*


**Chemical Age Enquiry Service.**

★ *Detach this page complete then fold as marked overleaf to use the post-paid reply folder*


# Chemical Age


## ENQUIRY SERVICE



 *This is a special service for readers of*

**CHEMICAL AGE**

 *It is designed to give fuller information on equipment, apparatus, chemicals etc., mentioned in this issue—whether in the editorial text or in an advertisement*

 *Cut out the whole of this page, fold as instructed with post-paid address on the outside*



### Chemical Age

154 Fleet Street, London, E.C.4

Tel.: Fleet Street 3212

CUT ALONG THIS DOTTED LINE

Postage  
will be  
paid by  
the  
Licensee

2nd FOLD

No Postage  
Stamp  
necessary if  
posted in  
Great Britain  
or  
Northern Ireland

BUSINESS REPLY FOLDER  
Licence No. 2501

**CHEMICAL AGE**  
**154-160 FLEET STREET**  
**LONDON, E.C.4**

3rd FOLD

1st FOLD

# SAINT-GOBAIN

1 bis, Pl. des Saussaies, PARIS 8<sup>e</sup>  
Tél. : ANJ. 21-62

**Organic Chemical Division**



**recommends to you :**

## **for calendering**

GOBINYLE polyvinyl chloride resins  
type C.1 : mass polymerisation  
type C.513 : emulsion polymerisation

## **for injection**

LUCOLENE M plasticised vinyl compounds  
LUCOFLEX M special non-plasticised compounds  
MS : standard, light amber  
MT : transparent, colourless  
H : grey, for use with food products

## **for extrusion**

LUCOLENE S & H plasticised vinyl compounds  
LUCOFLEX R non-plasticised vinyl moulding powders for the extrusion of profiles

## **for insulation and covering of electric wires and cables**

LUCOLENE E plasticised vinyl compounds

You can obtain all  
details and  
technical catalogues  
on these  
products from:

**CLARITUDE LTD**  
19 Dunraven Street  
Park Lane  
LONDON W. 1.

Téléphone Grosvenor 39 81

**ACID & ALKALI  
RESISTING LININGS  
IN  
BRICK, TILE, P.V.C.  
&  
RUBBER  
FOR ALL TRADES**

**COMPLETE PLANTS  
FOR PICKLING  
FUME EXTRACTION  
&  
EFFLUENT  
TREATMENT**

**PICKLING TANKS 90 FEET LONG WORKING SUCCESSFULLY**

**RIZISTAL**

**ALL BRITISH GUARANTEED PRODUCTS**

**MANUFACTURERS  
OF  
SILICA, LATEX,  
CASHEW, FURANE, &  
POLYESTER RESIN CEMENTS**

**SKYMMIT & BRUSH-ON  
IMPERVIOUS COATINGS**

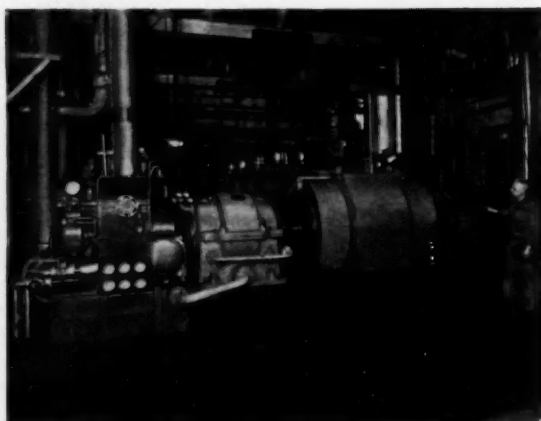
**P.V.C. & STAINLESS STEEL  
FABRICATIONS FOR ALL PURPOSES**

**JOHN L. LORD & SON**  
**WELLINGTON CEMENT WORKS**  
**BURY, LANCASHIRE**

TELEGRAMS: "CEMENT"  
PHONE: BURY 617

**RIZISTAL**  
TRADE MARK

## Small Back Pressure Turbines and Fuel Economy



The photograph shows one of two A.E.I. 1,250kW geared back pressure turbo-generators installed in the power house of the Trafford Park works providing steam for factory heating and processes at the minimum fuel cost. Similar machines varying from 100kW to 200kW are in service in various industries.

Larger direct-coupled back pressure turbo-generators with outputs up to 30,000kW, and for the highest initial steam conditions in commercial use, have been manufactured for industrial undertakings requiring large quantities of low or medium pressure steam at the highest overall economy.

## ASSOCIATED ELECTRICAL INDUSTRIES LTD. TURBINE-GENERATOR DIVISION

Incorporating the interests of M-V & BTH Manchester and Rugby

WORKS AT MANCHESTER AND RUGBY, ENGLAND • GLASGOW, SCOTLAND • LARNE, NORTHERN IRELAND

B/L401



